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THE NAUTILUS

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A NEW CONUS FROM JAMAICA, WITH NOTES UPON SCONSIA STRIATA

By MAXWELL SMITH

Mr. Heatheote M. Woolsey of Kent, Connecticut, visited Jamaica during the past winter and reports marine collecting especially good at Ocho Rios and vicinity. Among the specimens which he submitted for identification were a new *Conus* and examples of *Sconsia striata* which apparently were previously only reported with definite localities in the "Atlantis" dredgings. It was recorded from deep water off the Bahamas and Cuba, but not before from Jamaica. *Sconsia striata* Lamarck is a beautiful shell and represented in very few collections. The two present specimens were procured in traps set by fishermen at moderate depths off Ocho Rios. While not taken alive the shells exhibit all of the characteristic features. A description of the new *Conus* follows:

CONUS WOOLSEYI, new species. Plate 1, fig. 5.

Shell solid and strong. Color pattern consisting of china-white ground beneath the rather persistent brown epidermis, upon which are disposed three rows of chocolate brown, irregularly shaped blotches, which in shape resemble long winged birds in flight. Aperture oblique, deeply inset above, slightly wider anteriorly. Whorls 8, *not tuberculated above or at the periphery*, the latter rather sharply keeled. Sculpture consisting of extremely fine close, wavy spiral threads, with occasional diagonal scratches, and especially strong spiral threads anteriorly, the interspaces of the latter filled closely with the epidermis. Axial growth lines fine and irregular. Operculum not observed. Diameter 30 mm., height 53 mm.

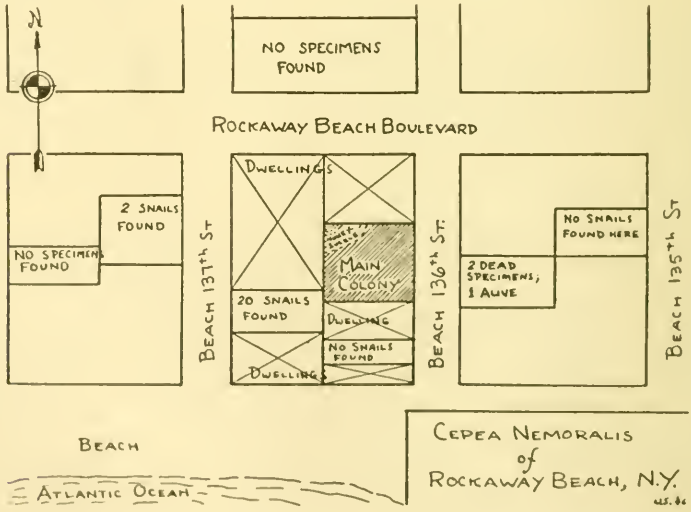
Differs from its nearest ally, *Conus regius* Gmelin, in the triform shape, the lack of the tuberculations so characteristic of *C. regius*, the much finer general sculpture and the more prominent anterior spiral threads, which are well shown in the figure.

Habitat: Obtained in fish traps off Ocho Rios, Jamaica. *Holotype:* the only example obtained, in Mr. Woolsey's collection.

AND NOW IN ROCKAWAY BEACH!

By MORRIS K. JACOBSON and WALTER SMIT

In The Nautilus of October 1945 (59:2) there appeared two reports of newly discovered colonies of *Cepaea nemoralis* (Linnaeus), one in Monroe Co., N. Y., and one in Rhode Island. On April 18, 1946, we found still another colony in so apparently unfavorable a locality as sandy Rockaway Beach, and only a few hundred feet from the very ocean at that! The area was a space very limited in size on the west side of Beach 136th Street, between the ocean and Rockaway Boulevard. Altogether it involves about six city lots (approximately 120 feet) and is 100 feet deep.



Most of the top soil that goes to make the gardening space of Rockaway is imported from Nassau county and other localities in Long Island, but the lot on which *nemoralis* was discovered, has developed an extremely thin layer of natural humus which supports a meager vegetation. There are no shrubs or

trees, although in the northern corner there is a heavy growth of honeysuckle vine (*Lonicera* sp.) escaped from neighboring gardens. In addition to a few tough beach grasses, we found the usual weeds of undeveloped Rockaway lots: Virginia creeper (*Psedera quinquefolia*), Queen Anne's lace (*Daucus carota*), golden rod (*Solidago* sp.), Yarrow (*Achillea millefolium*), etc. Garden trash discarded on this lot has provided enough cover to permit so much moisture to be retained that we even found a few specimens of morel mushrooms (*Morchella* sp.).

The snails were found, in company with *Zonitoides arboreus*, *Limax maximus* and *Deroceras reticulatum* (*"agrestis"*), under logs, corrugated and ordinary cardboard, in compost (garden trash), under bits of sheet metal and other cover. Shells of *Spisula solidissima* provided shelter for particularly crowded groups, and an old wooden-framed bed spring was a prolific source of specimens. The specimens with the best preserved shells came from the honeysuckle bush. Many specimens were taken in the open in the scanty grass, but when some of these were sent alive to Dr. Pilsbry he promptly called them "the most ill-favored" lot he had seen, only shreds of the perioatracum remaining. Local pride impelled us to mail him another set of more decent shells.

In the same personal communication (April 26, 1946) Dr. Pilsbry also commented on the large preponderance of unbanded shells. In this respect our Rockaway colony differs decidedly from the Rhode Island colony described by Ellen G. Matteson. Among 293 mature specimens collected, we counted

209 specimens with the formula 00000
76 specimens with the formula 12345
6 specimens with the formula 00300

and one each with the formulas 12045 and 12340. In most banded specimens the bands are quite distinct, only very few offering such formulas as 123(45) or (12)345.

The color is uniformly greenish lemon yellow ("*lemon yellow" to "*wax yellow" of Ridgway's plates IV and XVI, thin younger ones verging towards "pyrite yellow"), and the bands and lips a rich brown or almost black, sometimes bordering on maroon. In several specimens there appears near the lip a

slight reddish tinge that resembles the ground color of many shells from the Brighton colony in upper New York, which Mr. Blakeslee was good enough to send us. Dr. Pilsbry also found our specimens rather small, but one in particular is so small (19 mm. in diameter) and so elevated that except for the colored lip it might be taken for an unbanded *Cepaea hortensis* (Müller).

Although *nemoralis* has been found on Long Island (in Flushing), there is no evidence that our colony descends from that one. The extreme localization of the Rockaway colony indicates the youth of this group, a fact which is borne out by the statement of a neighbor who reported she had become aware of the existence of the snails only about two years ago. In view of the large number of individuals and the numerous dead and bleached shells, this statement is probably extreme. But it is doubtful that a period of more than five years can be assigned to the snail colony on Beach 136th Street.

Since the current building boom in the Rockaways foretells a limited life span for our colony, we have undertaken to transfer large numbers of the snails to other localities in the neighborhood where building activities are less likely. Prudence forbids us to identify these localities more closely. But at any rate it is to be hoped that though the snails will probably be eliminated from their original home lot, the Rockaway colony will manage to survive elsewhere in the neighborhood.

COLLECTING MOLLUSKS AT HOT SPRINGS, VIRGINIA

By ROBERT C. ALEXANDER

When I started out along the north walking-trail the morning of June 13, 1946, my purpose was to try to collect some of the mollusks that inhabit this part of the mountain region of Virginia.

It had rained hard the night before, but the rain stopped before daylight. As I walked along the trail, sunlight sparkled on drops of rainwater caught in the grass and on the foliage. Rivulets of clear water running from the hot and cold mineral springs for which this place is famous, gleamed in the sunlight

as they flowed to join and form a stream in this narrow valley in the Alleghany Mountains, 2300 feet above sea level.

The north walking-trail begins at The Homestead. It winds for three miles and a quarter beside a golf course, past partly cleared fields and thickets, through open woods and forest land on the mountain slopes, and finally leads back to the hotel again.

On a shaded slope above the trail where dead leaves were collected in drifts and piled high against fallen tree trunks and the ghostly pale Indian Pipe grew in clusters from decayed organic matter in the rich damp soil, I found shells of *Triodopsis albolabris* Say, *Triodopsis tridentata* Say, *Mesodon thyroidus* Say, *Mesodon inflectus* Say, *Mesomphix inornatus* Say, and *Haplotrema concavum* Say.

Stopping on a rustic footbridge to look down at the cold clear water flowing from a spring nearby, I saw that many of the stones in the water had small protuberances on them formed apparently of little fragments of slate or stone cemented together. Upon closer investigation, these were found to be the homes of certain insect larvae that live in the water and build these curious limpet-like structures for their protection. Their habit of living in these strange homes in the water has often caused these insect larvae to be confused with mollusks (cf. *Valvata arenifera* Lea).

Bending down at the water's edge, I noticed a tiny species of land snail, *Cochlicopa lubrica* Müller, on blades of grass trailing in the water. Some of them had retreated into their shells and were at the mercy of the current; others were actively moving about. Although this species ordinarily inhabits moist places, it is a mystery why most of them were immersed in the water when I collected them. Perhaps the downpour during the night washed them into the rivulet. Certainly these tiny air-breathing mollusks could not long remain under water and continue to live.

Dr. Henry A. Pilsbry states that this is one of the southernmost localities reported in the east for *Cochlicopa lubrica*. A variety is found farther south.

Not far away in the small stream formed by the rivulets from the springs, I collected several specimens of the freshwater snail *Goniobasis nicklíniana* Lea. Lea designated Bath County,

Virginia, as the type locality for this species, but a note accompanying specimens described as "part of the original lot" (A.N.S.P. 64477) states more specifically that they were "found by P. H. Nicklin in a rivulet near the Hot Springs Hotel (before The Homestead), Bath County, Va., Sept. 8, 1840." It is quite likely my specimens were collected in the same stream or rivulet probably not far from the very spot where Mr. Nicklin, for whom the species is named, collected his specimens.

It is gratifying to know that *Goniobasis nickliniana* Lea can still be found alive in the same locality where it was originally collected more than a century ago. In fact, the species, of which Lea said "the purple color of the interior of most of the specimens gives the shell a very dark appearance," seems to have flourished. Large numbers of these dark-shelled mollusks can be seen climbing on stones in the stream. They seem to have prospered in size too. Lea gave a length of .45 of an inch for the type. My specimens, the largest I could obtain, are over half an inch in length and the largest one is .57 of an inch long.

CONDYLOCARDIA IN FLORIDA AND MIDDLE AMERICA

By H. A. PILSBRY and AXEL A. OLSSON

Condylocardia floridensis, new species. Plate 1, figs. 9, 10.

The shell is very small, globose, subcircular and with strongly ribbed sculpture; umbos with a prominent prodissoconch surrounded by a raised edge or collar and appearing relatively large because of the minute size of the adult shell; both sides of the dorsal margin are flattened, smooth, forming excavated, lunular and escutcheon-like areas, that on the anterior side being widest. Externally the sculpture is formed by 11 strong ribs which are rather strongly beaded or noded, especially in their ventral portion and along the posterior margin; the ribs are separated by wide, deep furrows, across which there are delicate threads, irregularly developed. Internally, the ventral margin is strongly grooved by the ends of the ribs and in recent shells, which are translucent, the ribs and furrows show clearly through the shell wall. The hinge characters in recent specimens are generally difficult to distinguish clearly but appear as follows: the hinge plate is well-developed with a deep, submedian,

internal ligament or resilium pit which is set slightly obliquely, its lower end being directed a little backwards; in the left valve, the resilium is bordered behind by a large, knob-like, perhaps more or less hooked, cardinal tooth, while on the anterior side there is a small cardinal tooth, sometimes scarcely distinguishable at the upper end of ligament pit, and a small socket below it a little more forward; the right valve has a cardinal tooth on each side of the resilium; a single, strong, lateral socket is present in each valve, placed distantly from the center of the hinge and in which the prominently bevelled edge of the opposite valve fits; the left valve has the posterior lateral and the right valve carries the anterior lateral. Color of recent specimens is usually a pale yellow, occasionally pure white. Length 1.25 mm., height 1.1 mm.

Condylocardia floridensis is not uncommon at Ohio Key, southern Florida, type and paratypes No. 181311, A.N.S. Phila., others in the Olsson collection. These shells were picked out of beach sand made up largely of the foraminiferal tests of *Archaias aduncus* (Fichtel and Moll.), *A. compressus* (Orbigny), *Sorites*, *Heterostegina*, *etc.* A few specimens of the species have also been obtained from the Caloosahatchie Pliocene at Ortona Locks. We have received also a small specimen from Matanzas Bay, Cuba, through Dr. Pedro Bermudez and Señor Primitivo Borro.

These small shells are perhaps more common in our American faunas, recent and Tertiary, than previously suspected, but have been overlooked in collecting because of their minuteness or by being mistaken as the young of species of *Cardita*. Recent discoveries have shown the group to be rather widely distributed in both east and west American waters. Along the west coast, we know of three species, one recent and Pleistocene and two as Tertiary. *Condylocardia panamensis* Olsson is recent, and extends from western Panama southward to Ecuador. The Ecuadorian Oligocene has two still undescribed species. On the Caribbean side, a single species was described by Dall as *Carditopsis bernardi* from the Pliocene of Puerto Limon, Costa Rica. It was based on a single specimen, and only the interior has been figured. Two other species, still undescribed, are found in the Lower Miocene La Rosa sand, of Maracaibo. Dall's *bernardi* is somewhat similar to the shell from Florida but is said to have 14 ribs and its form is more oblique.

A NEW GASTROPOD OF THE GENUS EPISCYNIA MÖRCH

By A. MYRA KEEN

Stanford University, California

Several unusual finds have come to light among a collection of mollusks dredged in shallow water off Santa Cruz Island, California, by Dr. Willis G. Hewatt; notably, a specimen of "*Opalia*" *tremperi* Bartsch, a new *Pseudomelatoma* that will be described by Dr. Paul Bartsch, and a small gastropod of a genus not hitherto reported in California.

In a recent issue of The Nautilus, Pilsbry and McGinty [1] have given an admirably thorough, though brief, resumé of known species of this genus, *Episcynia,* which renders needless a review here. One further record is added, however, to the list of localities for the Floridan species, *E. multicarinata* (Dall).

Family Vitrinellidae Bush, 1897
Genus Episcynia Mörch, 1875

Episcynia Mörch, Malakozoologische Blätter, Bd. 22, 1875, p. 155. Genotype (by monotypy): *Architectonica* (*Episcynia*) *inornata* (D'Orbigny) = *Solarium inornatum* D'Orbigny in Sagra, 1842.

Original description of subgenus *Episcynia:* "T. hyalina, carina duplice serie ciliorum, apice simplice, non inverso." (Shell hyaline, the carina with a double series of cilia, apex simple, not inverted.)

As Bush [2] and Pilsbry and McGinty [3] have shown, the often-used family name Cyclostrematidae is inappropriate for any element in the American fauna, the genotype of *Cyclostrema* being a form that resembles certain South Pacific Liotias.

[1] Nautilus, vol. 59, no. 3, pp. 80–81, 1946.

[2] Bush, Katherine J. Revision of the Marine Gastropods Referred to *Cyclostrema, Adeorbis, Vitrinella,* and Related Genera; with Descriptions of Some New Genera and Species Belonging to the Atlantic Fauna of America, Trans. Conn. Acad. Sci., vol. 10, Art. 3, pp. 97–144, 2 pls., July, 1897.

[3] Pilsbry, H. A., and McGinty, T. L., "Cyclostrematidae" and Vitrinellidae of Florida, II, Nautilus, vol. 59, no. 2, pp. 52–59, Oct. 1945.

Hence, the next available familial name, Vitrinellidae, is adopted. Modern workers seem agreed that *Episcynia* is, generically, closely related to *Vitrinella*. Although superficially it somewhat resembles *Architectonica*, Möreh's allocation has long ago been abandoned.

EPISCYNIA DEVEXA Keen, new species.[4] Plate 1, figs. 1–4.

Shell small, depressed, whitish, with 5¾ whorls; spire conoidal, smooth except for somewhat sinuous microscopic lines of growth and an almost imperceptible carina midway between sutures; periphery marked by a smooth, rounded carina with filamentous fringes of thin yellowish-brown periostracum above and below; suture appressed on spire but from third whorl onward descending farther and farther below periphery of previous whorl, thus rendering the shell scalariform; base slightly convex, wrinkled near the deep, scalar umbilicus; umbilicus bounded by a roughened keel; aperture rounded-quadrate, outer lip broken in holotype, evidently a little sinuous; parietal callus faint. Diameter (not including filaments) 4.0 mm., height 2.9 mm, height of body whorl 1.17 mm.

Type locality: Scorpion Harbor, Santa Cruz Island, Santa Barbara County, California, in 2 to 3 fathoms. Holotype in Stanford Univ. Paleo. Type Coll., no. 7907.

Episcynia devexa is larger and proportionately higher than any described species of the genus, and the degree to which the suture descends below the periphery of previous whorls is greater than in any other. So far as I have ascertained, no author has noted this deflection of the suture as a diagnostic feature of the genus. The original illustration of the genotype (reproduced by Tryon[5]) merely hints at it. The deflection is clearly shown in a specimen of *E. inornata* in the collection of the United States National Museum (no. 449160, from Cayo Arenas, northwestern Cuba, in 2 fathoms); in two specimens of *E. multicarinata* (Dall) from Marco, Florida—a locality not previously reported for this species—(Stanford University collection, collected in 2 fathoms by Henry Hemphill); in the figure of *E. multicarinata* given by Pilsbry and McGinty;[6] in the

[4] From the Latin adjective *devexus*, bending down, shelving.

[5] Manual of Conchology, vol. 9, pl. 6, figs. 32–33, 1887.

[6] Nautilus, vol. 59, no. 3, pl. 8, fig. 6.

figure of *E. naso* (Pilsbry and Johnson);[7] and in the figure of *E. nicholsoni* (Strong and Hertlein), discussed below.

The serrations of the peripheral keel, so characteristic of other species of the genus, are wanting in *E. devexa*. That the holotype was only recently dead when taken is shown by the fresh condition of the periostracum. However, the operculum is missing, so that final evidence for the placing of the genus in the family Vitrinellidae still remains lacking.

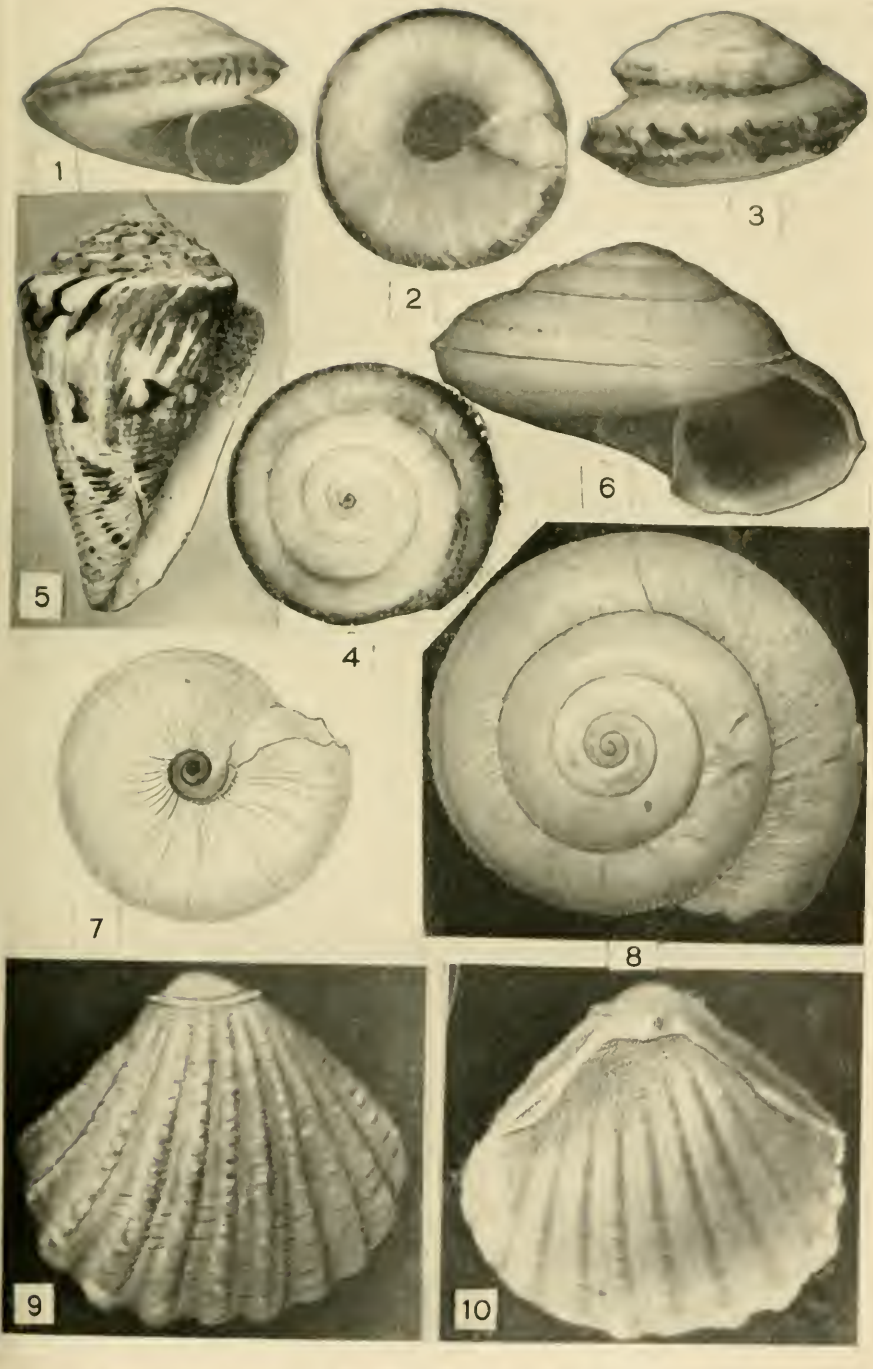
There seems to be but one other named species of *Episcynia* in the Pacific—*E. nicholsoni* (Strong and Hertlein).[8] This may be distinguished from *E. devexa* by its smaller size (diameter 3.1 mm.), less elevated spire, and serrate keel. The original figure shows a descending suture but does not show any periostracal fringe. Dr. Leo G. Hertlein informs me (personal communication dated March 7, 1946) that traces of the periostracum above and below the serrate keel are observable in the holotype.

To the paleontologist, the presence of this characteristically tropical-American form in temperate water, fully ten degrees of latitude north of the northern boundary of the Panamic marine province, is cause for speculation. Is it a direct survivor of the Californian Temblor fauna which, during the Miocene—when the Panama portal was open—became strongly tinged with Caribbean migrants? Or is it a fresh migrant itself since late Tertiary and Pleistocene times when colder currents from the north caused local extinction of subtropical forms that had been abundant in the San Pedro area? Whatever its history, it points up the kinship between the Californian and Panamic faunas and between those two and the Caribbean, all three having had much more in common during the past than they have at present.

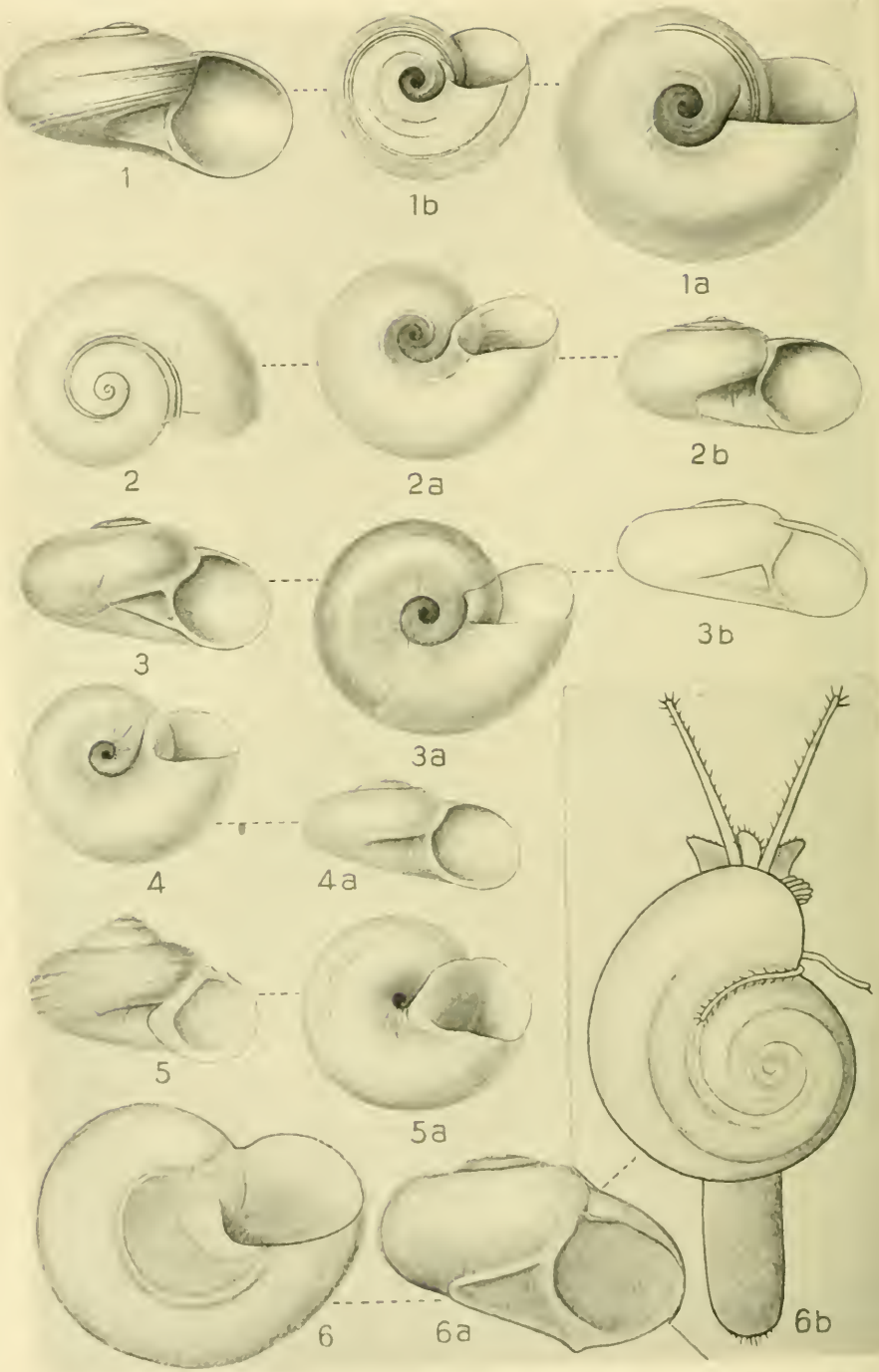
I wish to thank Dr. Willis G. Hewatt for permitting me to study the material he collected on Santa Cruz Island; Dr. Paul Bartsch for the loan of specimens; Professor Siemon W. Muller for criticism and advice; and Mr. David Nicol for verifying a reference. Funds for preparation of illustrations were supplied by the Research Committee of Stanford University.

[7] Proc. Acad. Nat. Sci. Philadelphia, vol. 73, pl. 37, fig. 5, 1922.

[8] Described as *Circulus nicholsoni*, Univ. Southern Calif. Publ., Allan Hancock Pacific Expeditions, vol. 2, no. 12, p. 241, pl. 22, figs. 2–4, August, 1939; type locality, Tobago Island, Panama, 3–9 fathoms.



1–4, *Episcynia devexa*. 5, *Conus woolseyi*. 6–8, *Episcynia bolivari*. 9–10, *Condylocardia floridensis*.



1–1a, *Vitrinella praecox*. 2–2b, *V. filifera*. 3–3b, *V. helicoidea*. 4, 4a, *V. floridana*. 5, 5a, *V. terminalis*. 6, 6a, 6b, *Teinostoma carinicallus*.

FIG. 1. *Episcynia devexa*, new species. Apertural view of holotype, Stanford Univ. Paleo. Type Coll. no. 7907. Diameter, 4.0 mm. FIG. 2. Basal view. FIG. 3. Same specimen as seen from the rear. FIG. 4. Same specimen, apical view.

ANOTHER PACIFIC SPECIES OF EPISCYNIA

BY H. A. PILSBRY AND AXEL A. OLSSON

EPISCYNIA BOLIVARI, new species. Plate 1, figs. 6, 7, 8.

Shell helicoid, biconvex, carinate, white, of rather thin texture; with a low, convexly conoidal spire of 5¼ rather weakly convex whorls joined by a well marked but shallow suture, which terminates immediately below the peripheral keel. Upper surface somewhat polished and smooth except for irregularly distributed and very faint, retractive lines of growth; the last whorl is very slightly angular a little distance above the narrow peripheral carina; the latter being in some places very minutely serrate; basal surface is rather slightly but evenly convex, polished, and marked with somewhat sinuous lines of growth, and low radial folds towards the umbilicus. The umbilicus is deep, scalar, contained 4½ times in the diameter, with a sharp marginal angle slightly overhanging the flat vertical walls, which are smooth except for two fine spiral threads near the suture. The aperture is but little oblique, irregularly quadrangular. Peristome thin and sharp, the columellar and outer margins connected by a very thin parietal glaze. Columella subvertical, weakly concave, slightly thickened, more or less strongly angular and slightly effuse at junction with basal margin of lip. Diameter 3.9 mm., height 2 mm.

Zorritos, Peru, type 181311 A.N.S.P.; Isla del Gallo, Colombia, paratype. Also fossil in the Pleistocene of Quebrada Rabo de Puerco, near Puerto Armuelles, Chiriqui, Panama.

This graceful shell is separable from other Pacific species by its form and the minute almost vanishing serration of the peripheral carina. The Miocene species *Episcynia naso* (Pils. & Johns.), of Santo Domingo, has a much more coarsely toothed or serrate carina. In the recent *E. multicarinata* (Dall) also, the serration is decidedly more conspicuous. Compared with Pacific species, this snail is more elevated than *Episcynia nicholsoni* (Strong and Hertlein),[1] judging by the figure of that

[1] *Circulus nicholsoni* Strong and Hertlein, 1939, Allan Hancock Pacific Expedition, vol. 2, p. 241, pl. 22, figs. 2, 3, 4.

species; in the text there is an evident error in the dimensions, which are given as: diameter 3.1 mm., alt. 0.8 mm. The sculpture of *E. nicholsoni* appears to be far coarser than in our species. *E. devexa* Keen is a somewhat higher shell with larger umbilicus, and having the last whorl descending conspicuously below the smooth keel. While further collections may possibly show less descent than the type specimen (which may be a little abnormal), there is likely to be decidedly more descent anteriorly than in our *E. bolivari*, where there is none. The two species seem to be closely related otherwise.

The serration of the peripheral carina of *E. bolivari* is extremely fine, and is visible only in places, much of the contour being smooth. The presence of inconspicuous traces of angulation and roughness of the periostracum shortly above the keel apparently indicates that fresh specimens have periostracal fringes as in *E. multicarinata* (Dall) and *E. devexa* Keen.

VITRINELLIDAE OF FLORIDA, PART 4

By HENRY A. PILSBRY and THOMAS L. McGINTY

In our former consideration of *Climacia*, Nautilus, vol. 59, p. 77, we failed to investigate the standing of that name, which our Cuban friends have found to be a homonym. They replaced it by *Climacina*, which unfortunately had already been used for a genus referred to the Eulimidae; so that we are compelled to impose still another name upon these helpless midgets. The taxonomic references now stand thus:

Anticlimax, new name

Climacia Dall, 1903.—Pilsbry & McGinty, 1946, Nautilus, vol. 59, p. 77. Not *Climacia* M'Lachlan, 1869 (Neuroptera).

Climacina Aguayo & Borro, 1946, Revista Soc. Malac. 'Carlos de la Torre,' vol. 4, 11. Not *Climacina* Gemmellaro, 1878, Giorn. Sci. Nat. ed Econ. Palermo, vol. 13, p. 126 (Mollusca).

The genotype remains *Teinostoma* (*Climacia*) *calliglyptum* Dall.

VITRINELLA

C. B. Adams, 1850, Monograph of Vitrinella, p. 3.—K. J. Bush, 1897, Trans. Conn. Acad., vol. 10, p. 105, type *V. helicoidea* C. B. A.

In the typical group of *Vitrinella* the shell is thin, minute, depressed and umbilicate, of 3 to 4 subtubular whorls. The umbilicus has rather flattened walls and is bounded by a spiral cord or thread. The rounded aperture is oblique, with a thin peristome, its upper margin arching forward. The columella is thin or only moderately thickened. The thin operculum is multispiral, but its whorls, except the last one or two, are indistinct.

We leave in the genus also some forms differing from the above by having the whorls convex within the umbilical cavity, without a spiral cord. It does not seem practicable at present to separate generically the shells referred by K. J. Bush and others to *Circulus*. Miss Bush has suggested that it is a subgenus of *Vitrinella*. These shells usually have spiral sculpture.

VITRINELLA HELICOIDEA C. B. Adams. Plate 2, figs. 3, 3a, 3b.

C. B. Adams, Monog. Vitrinella, p. 9.—Pilsbry, Notulae Naturae, No. 162, p. 2, fig. 1.—Pilsbry & McGinty, Nautilus, vol. 59, pl. 2, fig. 5, living animal.

The Floridan specimens appear to be typical. The figures are from one of a series from the North Inlet of Lake Worth, Palm Beach, collected by T. L. M.

They live under rocks. The shells of specimens collected alive are glossy, slightly milky transparent, whitish around the umbilicus, but many of them are stained a rich mahogany red. The aperture is rounded, with a small parietal excision where the penult whorl intrudes, and angular above; but in a basal view it appears somewhat squarish, as the baso-columellar part of the peristome recedes, the columellar margin then running forward on the base and a little thickened within. It is this slight thickening which causes the whiteness around the umbilicus. The upper margin of the peristome arches strongly forward. Diameter 2.3 mm.; umbilicus contained 3.3 times in the diameter.

Other records are: Fisher Island, Miami, and Conch Key, collected by T. L. McGinty & J. A. Weber.

The living animal (Nautilus, vol. 59, pl. 2, fig. 5) is translucent white, pinkish around the head. In movement the foot does not extend back beyond the shell, and is rounded posteriorly.

The series from Lake Worth shows some variation in the degree of depression, figure 3b representing the lowest from one lot. The highest is somewhat higher than figure 3. Two measure: Diam. 2.3 mm., height 1.3 mm., and diam. 2.4, height 1 mm.

VITRINELLA PRAECOX, new species. Plate 2, figs. 1, 1a, 1b.

Vitrinella. . . . Nautilus, vol. 59, pl. 2, fig. 4.

The shell is umblicate, the width of umbilicus contained 3¾ times in the total diameter; depressed, rather thin, grayish-white;[1] in the adult state smooth, except that there are usually about three weak spiral threads above the periphery (and sometimes several on the convexity of the base; the immature stages with stronger spirals as described below). The spire is quite low. Whorls 3½, convex, the last 1½ a little concave below the suture. Last whorl is well rounded peripherally and at base, a little concave close to the strong cord which overhangs the umbilicus. The aperture is weakly oblique, rounded; the peristome thin; columellar margin distinctly thickened in the basocolumellar arc, especially at the termination of the umbilical cord. Parietal callus thin. Diameter 1.6 mm., height 0.75 mm.

North end of Lake Worth (T. L. McGinty), type A.N.S.P. 181881. Paratypes A.N.S.P. 181882, other paratypes in McGinty coll.

This is a larger shell than *V. bicaudata*, more depressed, and having well developed spiral cords in immature stages, more or less or almost completely obsolete in the full grown stage. The living animal has not been observed.

In immature shells (pl. 2, fig. 1b) the peripheral cord is rather strong, and followed by a space which is either plain or has several small spirals, after which there are several spiral cords on the base. This sculpture weakens with age, and in the smoothest examples, only weak traces of it remain in the adult.

The living animal (Nautilus, vol. 59, pl. 2, fig. 4) is translucent white, pinkish around the head. The small black eyes

[1] The shells are usually stained, pale brown or reddish brown.

as in *V. helicoidea*, at outer bases of the tentacles. The foot does not extend beyond shell, and is rounded at the end.

We feel sure that the eyes of these mollusks are of little use to them. They are not at all sensitive, or, at least, show no reaction to the strong light used in drawing them. Where they are found, under stones, there must be practically no light. Probably the ciliated tentacles give them a fine sense of touch, enabling them to get about in total darkness. In drawing them one notices that they move with rapidity remarkable in such minute snails. It is hard to keep them in the field, even when using a low power of the mieroscope.

Vitrinella filifera, new species. Plate 2, fig. 2, 2a, 2b.

The shell is depressed, umbilicate, the width of umbilicus contained a little more than 4 times in the diameter; thin, white (dead), smooth. The upper surfaee is convex with slightly prominent apex, the whorls convex, the last whorl having a cord a short distance below the suture and parallel to it, becoming weaker near the aperture; the periphery is broadly rounded; base convex, a little impressed along the cord around the umbilicus; which in its last turn enlarges to about double its former width and is bounded by a cord which becomes weaker near the aperture. The aperture is rounded, somewhat oblique, the peristome thin, upper margin is strongly arched forward, retracted to the upper insertion, the basal margin straightened or a little curved forward in a basal view, and there is a slight angle at the termination of the umbilical cord. The columella is slanting, nearly straight, rather thick. Parietal callus thin. Diameter 1.25 mm.; height 0.7 mm.; 3¼ whorls.

Type A.N.S.P. 181879, Biscayne Bay at Baker's Haulover, Miami, Florida (J. A. Weber).

The strong thread which follows the suture and the strongly convex outline of the upper margin of the aperture, in apical or basal view, are distinctive features of this snail, which has not yet been found alive.

Vitrinella (Tomura) bicaudata Pilsbry & McGinty. Nautilus, vol. 59, pl. 2, fig. 9.

The shell is umbilicate, the width of umbilicus contained nearly 5 times in the diameter, globosely depressed, rather thin, smooth,

grayish white, slightly translucent. The upper surface is evenly convex. There are 3 moderately convex whorls and a minute apical dimple; the last whorl very wide, well rounded. The base is convex, becoming a little concave near the strong angle or cord which overhangs the umbilicus. The aperture is rounded, only slightly oblique; peristome thin, the columellar margin very slightly thickened, arcuate. Parietal callus thin.

Diameter 1.2 mm., height 0.75 mm.

The extremely thin operculum is slightly concave externally, of the multispiral type with subcentral nucleus; the spiral figure is indistinct, but somewhat over one whorl is visible.

Missouri Key, Florida, living under rocks (T. L. McGinty, March, 1945).

This is a more elevated shell than *Vitrinella helicoidea* C. B. Ad., with relatively larger aperture and smaller umbilicus.

One of us (T. L. M.) took three of these, all with the same cleft tail, and kept them living together. They may be cannibalistic, for on the third day the animal of one was gone and on the fourth day only a single specimen remained alive.

When the living animal was found last year we thought that it represented a new genus which we called Tomura (Nautilus, vol. 59, pl. 2, fig. 9). The animal is formed as in *Vitrinella* except that the foot is bifid posteriorly, and the tentacles do not appear to bear any cilia; but the shell has all the characters of the typical section of *Vitrinella*. Pending further studies of living Vitrinellae we are holding the status of *Tomura* in suspense, as it could not be recognized by the shell alone.

Vitrinella floridana, new species. Plate 2, figs. 4, 4a.

The minute shell is depressed, whitish, smooth, openly umbilicate, the umbilicus contained 3.25 times in the diameter. There are barely 3½ convex whorls, the last whorl somewhat flattened below the periphery, rounded at periphery, base, and umbilical border, the umbilicus rather broadly open, perspective, the whorls visible within it convex. The aperture is rather strongly oblique, rounded angular above (or in a basal view it appears bluntly triangular). Peristome thin, the upper margin only moderately arched forward. The columellar margin is thickened and runs forward above. Parietal callus rather thick and short. Diameter 1.95 mm., height 0.95 mm.; umbilicus 0.6 mm. wide.

Northern Biscayne Bay near Baker's Haulover, Miami (Weber, McGinty & Pilsbry), type 181880 A.N.S.P., paratypes in McGinty and Weber collections. Also Indian River south of Sebastian, Indian River Co.; North Inlet of Lake Worth, Palm Beach; and Barnes Sound, Key Largo (McGinty).

The small size, rather large umbilicus without a bordering cord, and the feeble convexity of the upper margin of peristome, in apical or basal view, are its more conspicuous features.

VITRINELLA TERMINALIS, new species. Plate 2, figs. 5, 5a.

The shell is depressed, with low-conic spire and small umbilicus which enlarged rapidly in the last half turn, and is contained five times in the diameter; thin but moderately strong, white (dead). There are 4½ convex whorls joined by a rather strongly impressed suture. Last whorl is rounded at periphery and base. Sculpture of a few very weak but coarse spirals in the peripheral region. The last whorl seems to contract the umbilicus, within which it is convex. The aperture is rounded, quite oblique, the peristome thin outwardly, moderately curving forward above. The columellar margin is extremely thick, reflected over part of the umbilicus, passing into a rather thick but thin-edged parietal callus. Diameter 2.4 mm., height 1.7 mm.

Destin, northwestern Florida, in 19 fathoms (T. L. and P. L. McGinty, 1941), type 181883 A.N.S.P.

The conic spire has more whorls and a deeper suture than in typical Vitrinellae, and the columella is very heavily calloused. Just where it will finally be placed is uncertain. The umbilicus is quite small up to the last half whorl of the umbilical suture, when it becomes rapidly much wider.

TEINOSTOMA, subgenus ANNULICALLUS

Just what relation these snails bear to the group typified by *"Teinostoma" funiculus* Dall remains somewhat uncertain.

TEINOSTOMA CARINICALLUS, new species. Plate 2, figs. 6, 6a, 6b.

The somewhat depressed shell is thin but moderately strong, smooth, grayish white, imperforate, with low spire. There are about 3½ convex whorls, the penult becoming noticeably angular, the last whorl flattened below the suture, near which it is slightly concave, then obtusely but strongly angular, after which

it becomes broadly rounded peripherally. It is carinate at the base, the carina forming the outer border of a strongly concave callus which covers the umbilical region. The aperture is rounded, the peristome thin, somewhat retracted to the upper insertion; the concave columellar margin is thick; calloused, the callus limited by a shallow crease where it passes into the axial callus. Parietal callus is thin.

Diameter 2.7 mm., height 1.75 mm. Type.
Diameter 2.4 mm., height 1.5 mm. Clearwater.

Missouri Key, Florida, under rocks (T. L. McGinty). Type 181979 A.N.S.P., paratypes in McGinty and Weber collections. One and one-half miles off Cape Florida, in 70 feet (J. A. Weber). North Inlet of Lake Worth in several places; Fisher Island, Miami; Little Duck Key; west end Bahia Honda Key (McGinty). On the west coast at Fort Myers Beach (Weber) and Clearwater (Irene Clark, 1929).

This species resembles *T. lituspalmarum* rather closely, but it differs by being relatively more depressed and it is much larger, though with about the same number of whorls, *T. lituspalmarum* measuring: diameter 1.75 mm., height 1.2 mm. *T. carinicallus* shows no spiral striae (but in *lituspalmarum* these are extremely feeble, being faintly visible only on the upper surface of the last whorl). The specimen reported from off Cape Florida as *T. lituspalmarum* is not that species, but *T. carinicallus*. An old specimen from Clearwater has the columella and the parietal callus very thick.

The Panamic *Teinostoma ochsneri* Strong & Hertlein appears near to this.

SOME RECORDS OF MARINE MOLLUSKS FROM BRASIL

By MARGARET C. STEWART

The mollusks listed below were collected on the coast of Brasil and presented to the writer by Mr. J. Gillson. As records are so few from this region it was thought worth while to publish this brief list even though it is fragmentary for the region.

The *Hemifusus* is found on both east and west Atlantic shores. All the other species are bivalves, most of them typically West Indian. Identification by R. A. McLean.

PRAIA PEDRA, VIRADA

Arca candida Gmel.
Arca incongrua brasiliana d'Orb.
Plicatula gibbosa Lam.
Ostrea virginica Gmel.
Lima lima L.
Lucina pectinata Gmel.
Cardium muricatum L.
Pitar circinata Born
Tivela mactroides Born
Anomalocardia brasiliana Gmel.
Moctra alata Spengl.
Mulinia guadeloupensis Recl.
Tellina lineata Turton
Iphigenia brasiliensis Lam.
Tagelus gibbus Spengl.

ALCOBACA, BAHIA

Arca bisulcata Lam.
Arca campechiensis Gmel.
Cardium muricatum L.
Donax carinata Haul.

VICTORIA, ESPIRITO SANTO

Arca campechiensis Gmel.
Arca incongrua brasiliana d'Orb.
Cardium muricatum L.
Tellina angulosa Gmel.
Donax carinata Haul.

CARAPEBUS, ESPIRITO SANTO

Arca adamsi Smith
Arca campechiensis Gmel.
Arca candida Gmel.
Arca incongrua brasiliana d'Orb.
Plicatula gibbosa Lam.
Mytilus achatinus Lam.
Lucina pectinata Gmel.
Tivela mactroides Born
Anomalocardia brasiliana Gmel.
Mulinia guadeloupensis Recl.
Tellina angulosa Gmel.
Sanguinolaria operculata Gmel.
Tagelus gibbus Spengl.
Hemifusus morio L.

AMERICAN MALACOLOGICAL UNION

After an enforced period of quiescence during the war years, the Twelfth Annual Meeting of the American Malacological Union will be held in Washington, D. C., August 14–16. The regular meetings will be held at the United States National

Museum. It is planned to have an outing and out-door buffet supper at "Lebanon," the 450-acre estate of Dr. Paul Bartsch on Pohick Bay of the Potomac River.

There are two large tourist camps between Mount Vernon and Washington which offer cottages for two people at $1.00 and $1.25 a day; the latter have showers and other conveniences. Those who wish accommodations at one of these camps, please communicate immediately with Dr. Bartsch, Division of Mollusks, U. S. National Museum, Washington 25, D. C.

Please communicate promptly with Mrs. Harold R. Robertson, 136 Buffum Street, Buffalo 10, New York, if you expect to attend, so that plans for the annual dinner may be made. Titles of papers and time required should be sent to Dr. Harald A. Rehder, Division of Mollusks, U. S. National Museum.

THREE NEW PUPILLIDS FROM THE LOWER PLEISTOCENE OF CENTRAL AND SOUTHWESTERN KANSAS

By A. BYRON LEONARD

University of Kansas Museum of Natural History

The Pearlette Ash member of the Meade formation of southwestern Kansas is frequently underlain with mud, fine silt or sand which often yields a varied and populous mollusean faunule. These deposits, although bearing similar vertebrate and invertebrate faunules in Russell, Clark and Meade counties, Kansas, have not yet been satisfactorily correlated with beds in other areas, although it is generally understood that they are of lower Pleistocene age. Recent studies of the mollusean faunules of these deposits, at present incomplete, have resulted in the discovery of three previously unknown pupillid gastropods, which are described below.

Columella tridentata, new species. Plate 3, figs. 1, 2.

Holotype: Catalogue number 3737, University of Kansas Museum of Natural History. *Horizon and type locality:* Lower Pleistocene; sec. 35, twp. 14 S, R 11 W; 3 mi. SW Wilson, in Russell County, Kansas.

Diagnosis: Shell large, elongate, cylindrical with three well-developed lamellae; a strong angulo-parietal and a deeply immersed, rounded columellar lamella; whorls 7½.

Description of holotype: Shell large for the genus, subcylindrical, with 7½ compressed whorls; suture well impressed; umbilicus round, small, diameter only ⅛ diameter of body whorl; first 3 whorls enlarging rapidly, producing bluntly conic apex; remaining whorls increasing in size slowly but regularly; first 1½ whorls with finely granular sculpture, remaining whorls embellished with fine, diagonal, closely spaced growth lines; last half of body whorl compressed around axis, subangulate below; aperture small, subtriangular; peristome simple, continuous by thin callus across body whorl; lip relatively heavy (broken?); lamellae 3; the angular bluntly triangular, arising near angular lip of peristome and extending downward, curving slightly toward periphery; fused with parietal lamella except near termination, which is situated midway along peripheral border of parietal; parietal lamella (not visible in front view) deeply immersed, thick, heavy, broadly spatulate, rounded; columellar lamella compressed, peristome, including lamella, finely punctate. Measurements (in mm.): height, 5.2; diameter, 2.52; height of aperture, 1.5; diameter of aperture, 1.44.

Known only from the type. *C. tridentata* resembles *Columella hasta* in size and shape, but the latter lacks the lamellae, and has 9 whorls.

Gastrocopta proarmifera, new species. Plate 3, figs. 3, 4, 5.

Holotype: Catalogue number 3741, University of Kansas Museum of Natural History. *Horizon and type locality:* Lower Pleistocene; sec. 35, twp. 14 S, R 11 W; 3 mi. SW Wilson, in Russell County, Kansas.

Diagnosis: Shell with the characters of the subgenus *Albinula* Sterki, except that the parietal lamella is actually bifurcate, having a short heavy limb turned toward the periphery. The shell is ovate-oblong, with 7 lamellae, all exceptionally large and massive save the basal, always small and sometimes nearly obsolete, and the suprapalatal, which is small, but invariably present in a large series. The large, disc-shaped columellar lamella is a distinctive character.

Description of holotype: Shell perforate, rimate, ovate-oblong, summit obtusely conic. Whorls a little more than 6 in number, first 1½ finely granular, remaining whorls finely and diagonally striate; whorls only slightly inflated, last whorl compressed around axis, subangulate below; suture moderately impressed.

Aperture irregularly oval; peristome flared; lip thin and simple, reflected, adnate and continuous upon body whorl. A depressed, seamlike scar, behind peristome, indicates position of lower palatal plica. Lamellae 7 in number; a fused angulo-parietal, a columellar, a basal, lower palatal, upper palatal, and suprapalatal. The massiveness of the lamellae restricts the size of the orifice. The angular lamella arises from peristome above sinulus, curves, and is deflected toward periphery, fused with parietal at its lower termination; parietal heavy with rounded edges, bifurcate below, an elongate limb turns toward the periphery, a shorter, heavier limb curves toward the columella; columellar lamella, when viewed front in front, appears as of a slightly concave disc; it extends obliquely downward, the lower part most deeply immersed. Basal lamella almost obsolete, subcolumellar in position; palatal plicae on a low rounded callus; the lower palatal very deeply placed in cavity (above the termination of the parietal) heavy, bluntly chisel-shaped, transverse in cavity; upper palatal lamella less deeply immersed, less than ½ as large as lower palatal, termination rounded, and directed slightly toward the periphery; suprapalatal lamella small, nodular, located on lower border of sinulus. Lamellae and walls of aperture finely punctate. Measurements in mm.:

	Height	Diameter	Aperture Height	Aperture Diameter	Whorls
Type	4.08	2.16	1.60	1.4	6½
Paratype	3.37	2.0	1.44	1.24	6¼
"	3.93	2.16	1.50	1.44	6½
"	3.96	2.16	1.60	1.44	6½

G. proarmifera occurs in deposits 6 miles north of Meade, Meade County, Kansas, in addition to the type locality. This species resembles *G. a. ruidosensis* Cockerell, but differs from it in the following details: Lamellae generally more massive; the parietal distinctly bifurcate below; the columellar rounded, rather than triangular in profile, and the lower palatal much more deeply situated within the aperture.

Gastrocopta falcis, new species. Plate 3, fig. 6.

Holotype: Catalogue number 3729, University of Kansas Museum of Natural History. *Horizon and type locality:* Lower Pleistocene; SW ¼ sec. 2, twp. 31 S, R 28 W; 6 mi. N. Meade, Meade County, Kansas.

Diagnosis: A small species, the shell about 1.7 mm. in height. The shell is cylindrical, with 5 whorls. Seven lamellae, the

angular and parietal widely divergent, the latter curving strongly toward the periphery. The columellar lamella rises low in the orifice, extends toward the parietal, and is then reflexed toward the periphery, extending nearly to the free edge of the lip. The basal plica is transverse in the cavity; the lower palatal is large, deeply entering, elongate, and curved toward the periphery; upper and suprapalatals not unusual.

Description of holotype: Shell small, cylindrical, narrowly perforate; whorls 5 in number, moderately convex; summit obtuse; suture deeply impressed; first whorl microscopically granular, remaining whorls minutely punctate and striate; body whorl compressed around axis, broadly angulate below; aperture rounded below, squarish above; peristome thin, simple, and reflected, lips approaching, scarcely connected by a thin callus on body whorl; a constriction behind reflected lip of peristome, followed by a heavy crest on right side only; behind the crest an axially elongate, depressed scar indicates position of lower palatal plica. Lamellae 7 in number; angular, thin, high, confluent with angular lip of peristome above, and with parietal lamella below; it curves slightly forward, and is deflected toward, the periphery; parietal lamella heavy, widely divergent from angular above; below the lower end of the angular, where it is strong, high, and rounded, the parietal lamella curves toward the periphery; columellar lamella highly specialized; it arises low in orifice as a high plate extending toward the parietal, turns slightly upward, and extends straight forward on the columellar wall of the peristome to the point where the lip flares, where it ends in a thickened callus; the whole resembling a pruning knife with the thin edge turned toward the columella. No subcolumellar denticle; basal plicae heavy, triangular, deeply placed in the cavity; lower palatal plica arising broadly from the callus on which are set also the basal and upper palatal plicae, deeply entering, to a point above the termination of the angular, free surface plane; upper palatal plica less deeply placed, high, toothlike; two minute, conical suprapalatal plicae. Denticles and walls of orifice smooth and glistening. Measurements (in mm.):

	Height	Diameter	Aperture Height	Aperture Diameter	Whorls
Type	1.7	.87	.62	.55	5
Paratype	1.5	.87	.62	.59	5
"	1.75	.87	.62	.55	5

Only four examples known; one from the type locality, and three (one broken) from Pyle Ranch deposits, NE¼ sec. 11, twp. 30 S, R 23 W, Clarke County, Kansas. There is no significant variation from the type among these individuals. Even

more nearly cylindrical than *G. h. agna* Pilsbry and Vanatta, it is obviously related to this form, but it differs from *agna* in the following details: angular and parietal lamella more divergent anteriorly; parietal curving more strongly toward the periphery; columella lamella generally similar in form, but projecting further from the axis near its origin, extending further upward, and extending further forward on the peristome; basal plica transverse in the cavity; lower palatal larger, entering more deeply, elongate, and slightly curved toward the periphery, its free edge plane, upper palatal and suprapalatal not unlike the corresponding lamellae in *agna*.

A NEW FOSSIL PUPILLID

By DOROTHEA S. FRANZEN

University of Kansas Museum of Natural History

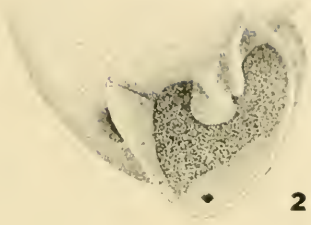
In order that a fossil pupillid, new to the fauna of North America, may be included in Doctor H. A. Pilsbry's second volume of "Land Mollusca of North America (North of Mexico)," the description of a new subspecies from a Pleistocene deposit is published at this time. Illustrations of this form will appear in a more comprehensive study of the Pupillidae of Kansas, now being prepared.

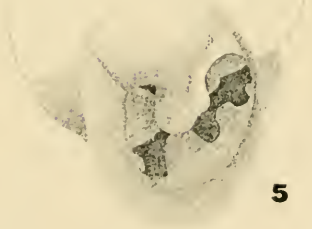
Pupilla muscorum sinistra, new subspecies.

Holotype: Catalogue number 3728, University of Kansas Museum of Natural History. *Type locality and horizon:* NE¼ sec. 11, twp. 30 S, R 23 W, Clark County Kansas; Lower Pleistocene.

Diagnosis: Shell sinistral, subcylindric, whorls 7½, convex, increasing regularly and gradually in height; lip reflected, thickened within by a callus; parietal tooth low, elongate, curved around the axis; crest behind the lip high and round.

Type description: Shell sinistral, subcylindrical, summit obtuse; whorls 7½, increasing regularly and gradually in height, convex; suture incised; greatest diameter at level of fifth whorl of spire from which the shell tapers to a constricted base; nuclear whorl finely granular; remaining whorls finely and irregularly striate; aperture ovate, oblique; lip reflected, thick-





1, *Columella tridentata*, × 7. 2, *Columella tridentata*, × 15.4. 3, *Gastrocopta proarmifera*, × 7. 4, *Gastrocopta proarmifera*, basal dissection, × 15.4. 5, *Gastrocopta proarmifera*, × 15.4. 6, *Gastrocopta falcis*, × 15.4.

ened within by a low, rounded callus; peristome sharp, continuous across parietal wall by a thin callus; dentition consisting of a single, low, elongate parietal lamella; crest behind lip high and round.

	Height	Greatest Diameter	Aperture Height	Aperture Width	Whorls
Type (3728)	3.9 mm.	1.9 mm.	1.25 mm.	1.08 mm.	7½
Paratype (3827)	3.8	1.8	1.15	0.9	7½
" "	3.7	1.8	1.08	0.9	7
" "	3.4	1.8	1.08	0.9	7
" "	3.2	1.7	1.08	0.9	7
" (3828)	4.0	1.7	1.25	—	7½

At the type locality, *Pupilla muscorum sinistra* occurs as a pure population. In a second locality, SW¼ sec. 35, twp. 14 S, R 11 W, Russell County, Kansas, three-fourths of the *Pupilla* population consists of *Pupilla muscorum* (Linneaus) and only one-fourth of *Pupilla muscorum sinistra.*

Size is the only appreciable variable among the paratypes. The parietal lamella is wanting in only a few specimens. A small lower palatal fold occurs rarely. The greatest diameter of the type specimen is at the level of the fifth whorl while in some of the paratypes the greatest diameter is at the level of the fourth whorl. *Pupilla muscorum sinistra* differs from *Pupilla muscorum* in being sinistral and in tapering to a more sharply constricted base.

NOTES ON LAMARCK'S "PRODROME" 1799

By HENRY DODGE

Lamarck's "Prodrome d'une nouvelle classification des coquilles" was read at the Institut National in Paris "le 21 frimaire an 7" (December 11, 1798). [It is presented here, in translation, because it is unavailable to many conchologists.] It has never been republished and the Memoires of the Société Naturelle de Paris, in the 1799 volume of which it appeared, is absent from some of our great libraries. It is a little known but exceedingly important work. It is the stepping stone to the conchological portion of Lamarck's later and greater work, the "Histoire Naturelle des Animaux sans Vertèbres," and marks the first listing and description of his own genera of mol-

lusks. It is thus not only his first important conchological work but it bridges the gap between the labors of the earlier students through Bruguière and the final perfecting of the Lamarckian system. However we may evaluate that system it must be understood if we wish to achieve any comprehensive view of the history of the nomenclature of invertebrates.

The progress of conchological nomenclature has followed the same route as that taken in all the other branches of zoology—that is, from a small number of groups with very broadly-described characteristics to a system of more selectively described groups. This has been brought about not only by the discovery of new forms but by the necessary dismemberment of older groups and their subdivision into smaller units whose characteristics are seen to be clearly separable from those stated in the generalized descriptions of the older conchologists.

Linnaeus, who placed systematic zoology upon a firm and universally understood basis by being the first to adopt binomialism completely, listed only thirty-three genera under *Vermes Testacea* in the 10th. Edition of the Systema Naturae. In his 12th. Edition, the last published before his death, he added only three, i.e., two new genera, *Mactra* and *Sabella,* and one, *Teredo,* which he moved from *Vermes Intestina.*[1] Thus Linnaeus placed all the species which he conceived to be mollusks into thirty-six genera.

Gmelin, his follower and the compiler of the 13th. Edition of the Systema, added no new groups to Linnaeus' list. He did not even include *Perna* which had been set up for inclusion in Linnaeus' proposed "Revised 12th. Edition," as is shown by the manuscript notes written into his own copy.

Passing over the Conchylien Cabinet of Martini and Chemnitz, whose questionable binomialism has already caused the work to be rejected by the International Commission as nomenclatorially unavailable, the first important and completely binomial general

[1] The *Vermes Testacea* of Linnaeus contains, of course, many species which are not true mollusks, being either Foraminifera, Annellida or Cirripedia. Also there are three genera of true mollusks—*Limax, Sepia* and *Tethys*—in *Vermes Mollusca,* that most unfortunately named group, another—*Monoculus*—in Order *Aptera* of *Insecta,* and a single species—*Terebella lapidaria*—in *Vermes Mollusca.*

work on Conchology after Gmelin is the shell portion of the Encyclopédie Méthodique of J. B. Bruguière (Histoire Naturelle des Vers, Tome 1, 1789–92). Bruguière did what Linnaeus would probably have done had he lived long enough. He made important changes in the development of Linnaeus' method by the dismemberment of some of the too-bulky groups of the Systema. He circumscribed the limits of *Voluta* by creating *Oliva*. He partially dismembered *Buccinum* and erected *Cassis* and *Terebra* out of it, as well as the placing the spinose and tuberculate members in his new *Purpura*. He began the elaborate reconstruction of *Murex*, taking from it those species which made up his new genera *Fusus* and *Cerithium*. He described *Placuna* and *Perna* for groups formerly included in *Ostrea*. (Lamarck, in his Eulogy of Bruguière in the foreword to the "Prodrome," credits him with the authorship of *Pecten* as well.) Linnaeus' *Chama* was reduced by the elimination of the species he erected into *Cardita* and *Tridacna*. Finally he improved many of the Linnaean pelecypod genera by removing and placing in their proper place many of the Brachiopods and Cirripedes which Linnaeus had erroneously included, and from the notes which he left at his death we know that he had already conceived *Lima*, *Lucina*, *Pandora*, *Capsa*, *Cyclas* and other genera, most of which are still valid today.

Lamarck took up the work of systematical conchology where Bruguière left off and carried the separation of genera far beyond the point reached by his predecessors. In the "Prodrome" he published for the first time the results of his own researches supplemental to the work of Bruguière and the Encyclopédie. It is the first important contribution to Conchology from Lamarck's own pen. It is important from the point of view both of the history of this branch of Zoology and of its nomenclature. He more than doubled the number of genera listed in the Encyclopédie, raising it from sixty-one to one hundred and twenty-six. The additional sixty-five genera included fourteen which had been described by others prior to the "Prodrome" but which had not been listed by Bruguière either because they had not been published at that time (? the "Bolten" Röding names of 1798) or possibly because they had not come to

Bruguière's attention.[2] His treatment of the Pelecypoda is particularly noteworthy as he was the first to clearly appreciate the value of the details of the hinge as a generic determinant. His hinge descriptions are confusing in places, but in the main he has put proper emphasis upon the position, shape and articulation of the teeth and their relation to the ligament.

The availability of the "Prodrome" as a source of genotypes has been much discussed although the question has not been passed upon by the International Commission in any published decision except inferentially. Many conchologists feel that it should be rejected for that purpose because its author gave no list of species but only selected one species as an "example." Some however are willing to accept the citation of these "examples" as valid type designations in the case of Lamarck's own new genera but deny their validity as types in the case of earlier-described groups. I find it difficult to see why the citation of a sole example is not a proper designation under the Rules even for those genera erected by Lamarck's predecessors as to which no valid type had been selected. There is no requirement even today that an author use the word "type" in his designation, and in any case the word was not current in Lamarck's day.

The International Commission, in Opinion 79, passed upon the availability of these "examples" as used in Lamarck's 1801 work, the "Système des Animaux sans Vertèbres," holding that: "'Rigidly construed' Lamarck's 1801 Système [etc.] is not to accepted as designation of type species." The two cases are similar but not identical. In the "Système" there are several cases where more than one species is cited as "examples." In

[2] In the foreword of the "Prodrome" Lamarck is not accurate in his figures. He mentions 123 genera whereas he described 126. Also he credits himself with the authorship of sixty-two "new" genera. Some of these had already been described by others so that the actual number to be cited as "Lamarck 1799" is somewhat less. It must be remembered that in Lamarck's day authors were not bound by official rules, nor were the canons of scientific etiquette as scrupulously observed as they are today. Likewise some of his predecessors works may not have come to his notice as he, like Bruguière, may not have seen the "Bolten" Catalogue. With this in mind and the fact that the authorship of some of Lamarck's "new" genera is still being discussed, I tentatively make the count of his unquestionably authentic additions as 47.

the "Prodrome" Lamarck confined himself to one species in all cases. Obviously where two or more "examples" are given the case for validity is weak unless one is willing to say that the author intended arbitrarily to select the first. From a reading of the Commission's discussion it is possible to argue that it felt that the mere multiplication of "examples" in some cases nullified the whole work as a source of types even though the single designations might have been considered good designations. It is improbable, however, that the Commission proceeded upon this basis, but rather that it rejected the "Système" on the broader ground that Lamarck's method was not sufficient as no apt language to show his intention was used. If this was the Commission's attitude then it must make the same ruling if and when they publish an Opinion specifically covering the "Prodrome." It may safely be said that it has already inferentially so ruled.

It is perhaps idle to discuss an Opinion once made but it is difficult to accept the reasoning upon which Opinion 79 is undoubtedly based. Lamarck's "intention" is expressed in the Forewords to the two works:

In the "Prodrome" he said:

"I confine myself in this memoire . . . to a simple statement of generic characters, and to the citation of a single species of each genus, *in order to make myself better understood*" (the italics are mine).

In the "Système":

"In order to make the genera whose characteristics I set forth clearly understood, I have cited under each of them one known species, or in a few instances several, and I have added certain synonyms to which I can certify; *this will be enough to make myself understood* (italics mine).

In a day when the word "type" was not in the vocabulary of the zoologist and when type designations were not made with the punctilio now required by the International Rules, what better method could be devised than that used by Lamarck in all those cases where only one "example" was given? This was the view expressed by Dautzenberg who, with Horvath, wrote a dissent to the majority opinion on the "Système." He said:

"At the time when Lamarck published his Système des Animaux sans Vertèbres he attached to the fixing of genotypes neither the importance nor the precision which we attribute to them today. In citing for each genus a known species, accompanied by references 'in order to make myself clearly understood' Lamarck certainly showed an intention to designate [voulu désigner] what we call types today. I would see no objection, so far as mollusks are concerned, to adopting as types the species cited as examples in the Système des Animaux sans Vertèbres, for it is only a question of two different words which have the same meaning."

It may be mentioned that of the one hundred and twenty-six genera in the "Prodrome" Lamarck chose Linnaean species for one hundred and one of them. In seventeen he used other examples and for the remaining eight he gave no example.

Outside of Opinion 79 the only comment on Lamarck's "examples" that I can find is that of Kennard, Salisbury and Woodward (Smithsonian Misc. Coll., vol. 82, No. 17, 1931). These authors hold that Lamarck "had no intention of doing more than cite examples," and offer in support of this view Lamarck's language which I have already quoted, from the Forewords to his two works. They continue:

"At the same time, when in these two works a new genus is proposed (or taken over from Bruguière not then having a named species attached) Lamarck's example, under the Rules, ranks as a genotype."

This paper was published seven years after the publication of Opinion 79, but the conclusion of the authors is directly contrary to the Opinion, and their interpretation of Lamarck's language is not only opposed to their main conclusion but also to what I believe Lamarck's intention to have been.

Whether or not one accepts the "Prodrome" as a source of genotypes, is after all not the only criterion of its value. And whether or not one belongs to that school which finds in the whole Lamarckian system a mere archaic phase of the history of zoology, which has been left behind by later commentators, the "Prodrome" is nevertheless a milestone in conchological history. It should be better known and given more diligent study than we moderns have been accustomed to give it.

Lamarck's descriptions presented a problem; whether to make a literal translation of his language or to use the terms employed in modern conchological English. Lamarck used an outmoded scientific vocabulary and his conception of the manner in which to describe the different parts of a shell are often curiously archaic according to our standards. His gastropods are divided according to the shape, or rather the continuity, of the aperture. He uses very sparingly the indications "anterior" and "posterior." He seems to be unable to distinguish varices and a mere thickening of the outer lip, and even uses the same word for a callosity of the columella and a thickening of the shell elsewhere. He uses the terms "bord droit" and "bord gauche" for the parietal and palatal lip and employs the word "lèvre" only in a few instances. It has nevertheless seemed wise to translate his language literally for the most part, using modern terms only where necessary to insure clarity. After all, what we want is to see the species as Lamarck saw them. Only in this way can we appreciate not only the advance which he made over his predecessors but also the historical significance of the very errors and confusions from which his work suffered.

I have translated the "Tableau" of genera exactly as written, adding nothing except the author and date after the name of each genus in order to emphasize Lamarck's own contributions.

(To be continued)

ON THE NAMING OF FAMILIES AND SUBFAMILIES

Various long-used family names have been changed in recent years by authors who thought, incorrectly, that a family name must be based upon the earliest genus of the group. There seems to be no advantage to science or to naturalists in such needless changes of well known names, changes which have never been authorized by the International Rules. The International Commission has recently reiterated its position on formation of family names in Opinion 141, which we reprint below.

Opinion 141. ON THE PRINCIPLES TO BE OBSERVED IN INTERPRETING ARTICLE 4 OF THE INTERNATIONAL CODE RELATING TO THE NAMING OF FAMILIES AND SUBFAMILIES.

SUMMARY.—The following principles are to be observed in interpreting Article 4 of the International Code relating to the naming of families and subfamilies:

(1) The oldest available generic name in the family need not be taken as the type genus of the family.

(2) An author establishing a new family is free to select as the type genus of that family whatever generic unit he considers the most appropriate.

Note: So far as possible, the genus selected should be the best known and commonest of the taxonomic units concerned, i.e., it should be the most central of the genera proposed to be included in the family so established.

(3) The name of a family is based upon the name of its type genus. The fact that a given generic name is selected to form the name of a family constitutes ipso facto a definite designation of that genus as the type genus of that family. Example: The genus *Musca* Linnaeus, 1758, is definitely and unambiguously designated as the type genus of the family Muscidae by reason of the stem of the word Musca being used in the formation of the family name.

Note: There are a few well-established family names proposed by early authors where the foregoing principle has not been observed. Such names should be treated as exceptions. Any case of doubt should be referred to the Commission for decision.

(4) The principles set out in (1) to (3) above in regard to family names apply equally to the names of subfamilies.

NOTES AND NEWS

DATES OF THE NAUTILUS.—Volume 59, no. 1, pp. 1–36, pls. 1–3, was mailed September 6, 1945. No. 2, pp. 37–72, pls. 4–7, Dec. 27, 1945. No. 3, pp. 73–108, pl. 8 and frontispiece, Feb. 9, 1946. No. 4, pp. 109–144, pl. 9, June 27, 1946.—H. B. B.

THE BLACKENED SHELLS OF EAST COAST BEACHES NOT NECESSARILY FOSSIL.—In the course of studies on the geographical distribution of bivalve mollusks along the eastern coast of this country I have been inclined to discredit some of the published records in the belief that they were not based on live material but often upon dead shells, as personal experience had shown me that many of the dead shells on these beaches were of a characteristic black color. Richards[1] has pointed out the oc-

[1] Nautilus, vol. 49 (4), p. 130, 1936.

currence of these black shells and suggests some may have been washed out of fossil beds located not far off shore. That this is sometimes the case is proven by the occurrence on these beaches of species which are not known from northern waters today. Colton [2] deals with "blue" specimens of *Pecten* and attempts to discover a morphological difference to correspond with an assumed difference in age. However it is unwise to assume that all black shells found in this way are fossils. While collecting at Beaufort, North Carolina, I noticed that on some nearby shoals shells blackened in this characteristic manner could be dug out of the silt and sand mixture only six or eight inches beneath where the living animals were to be found. In addition large shells such as *Macrocallista nimbosa* (Sol.) were found which projected from the surface down into this silt layer and they were blackened where they came into contact with the black mud while retaining their natural coloration on the portion of the shell which was still above the surface. Therefore I do not believe these black shells can be written off as of no interest to workers on recent material except in cases where shells of this type are found which have no living relatives in or near that locality. It is obvious that the black color alone does not indicated a shell of different age from a white specimen found at the same place.—R. A. McLean.

Helicina hartmani nom. nov.—This new name is proposed for *Helicina dominicensis* Hartman (Proc. Acad. Nat. Sci. vol. 42, p. 286, pl. III, fig. 9, 1890) which is preoccupied by *Helicina dominicensis* Pfr. (Proc. Zool. Soc., part XII, p. 149, 1851). The two sets of *Helicina dominicensis* in the collection of the Carnegie Museum from Dr. W. D. Hartman have the name *dominiquensis* Hart. written on the label, but these specimens were described as *dominicensis*. Nowhere have I been able to find the name *dominiquensis* mentioned in molluscan literature. *Helicina hartmani* was collected on Dominique Island, Marquesas Islands. Hartman's species was apparently overlooked by Wagner in his monograph of 1911, and by Fulton in the supplemental lists in Proc. Malac. Soc. London, vol. XI.—Gordon K. MacMillan.

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[2] Ibid., vol. 28 (5), p. 52, 1914.

Molluscan food items of the Houma Indians.—A collection of marine mollusks used as food by the Houma Indians of Louisiana was made by the senior writer at Houma, La., in the summer of 1938 and in the winter of 1941 while engaged in an ethnological study of this ethnic group. The Houma people of the present are of French and Indian descent from the Muskhogean linguistic family and now speak Louisiana French. Numbering some hundreds, they inhabit the coastal bayous and lowlands of Terrebonne and La Fourche Parishes just west of the Mississippi delta. They subsist primarily upon seafood, by fishing, shrimping, and trapping in the Gulf marshes, and are still little known through systematic investigation of their food habits under the ecological conditions of the Gulf Coast tidewater, where they have settled since their removal from St. Tammany Parish a century and a half ago. Mollusks are important food items of this group. The following snails are commonly eaten: The Fighting stromb, *Strombus pugilus* L.; the Rock Snails, *Thais floridana* Conrad and *T. floridana haysae* Clench; and one of the pear conchs, *Busycon perversum* L. Bivalves of the following species are often included in the diet: The Virginia oyster, *Ostrea virginica* Gmelin; the wedge Rangia, *Rangia cuneata* Gray; the beaked Rangia, *R. cuneata rostrata* Petit; and the hard-shell clams, *Venus mercenaria* L. and *V. campechiensis* Gmelin.—Frank G. Speck, Dept. of Anthropology, University of Pennsylvania, and Ralph W. Dexter, Dept. of Biology, Kent State University.

Deroceras agreste feeding on Armadillidium vulgare.—On March 17, 1946, while hunting for slugs, an overturned board revealed the slug, *Deroceras agreste* (Linnaeus), feeding on a "Pill Bug," *Armadillidium vulgare*. The pill bug was but recently dead when the slug began feeding upon it, or was possibly but recently killed by the slug, for it was very pliable and was in no way brittle. The slug was feeding on the under surface of the pill bug's head, and had successfully rasped through the relatively thin exoskeleton on the ventral surface, cleaning out the flesh that was within the bug's head. The pill bug's legs too were rasped away as the slug's radula moved along the ventral surface. The slug made no attempt to rasp through the

tough exoskeleton on the bug's dorsal surface. After the board had been overturned, the slug continued to feed on the pill bug for twenty minutes. At the end of this period, it retired to a clump of grass roots where it concealed itself.

In observing several thousand individuals of this garden slug pest in Oakland, California, this record is the first that the writer has observed of this slug feeding on any animal.—William Marcus Ingram.

Sinistral Anguispira alternata.—Last summer while at Higgins Lake, Michigan, I found a sinistral specimen of *A. alternata* (Say). Though this is a very common shell in Michigan, I have never heard of a sinistral specimen from the state. I found also *Lymnaea contracta* Currier there, and would like to exchange them and the *Anguispira* for Central or South American shells.—Jamie Ross, 1139 Martin Place, Ann Arbor, Mich.

South African aquatic snails.—A rain-fall of only approximately 27 inches in 1945, the least for thirteen years, with half the total falling in the months of February and March, has left *Physopsis africana* Krauss in river-pools developing to twenty millimetres and over, but free of larval trematodes until rains wash human excreta off the river-banks and swimming becomes prevalent.

Commander J. M. Amberson during his visit from Cairo asked me for some of our pond-snails, and I took him to Inchanga, where he collected *Physopsis* mostly, at 2000 and 2500 ft. altitudes. I have just visited the locality again and am sending you herewith a twenty-millimetre shell of *Physopsis africana* Krauss.

These observations show that we need not endeavour to eradicate a species of pond-snail, but concentrate rather on the short-lived, fragile, surface swimming "cercariae," which do not encyst, and are necessarily avoided in domestic supplies because all engineers forcibly disturb the water and make use of water in the lower levels of reservoirs and tanks.

I found only *Physopsis* in the Inchanga river, but *Lymnaea* and *Bulinus tropicus* abounded in a tank supplied with river-water.—F. Gordon Cawston.

NOTE ON VITRINELLA (TOMURA) BICAUDATA.—Since p. 16 was in type we noticed that some information was omitted. The type is 182042 ANSP. It has been taken also in the North Inlet of Lake Worth, at Snake Creek, Windly Key, and at Conch Key. The living animals from all of these localities are as described for *Tomura*.—PILSBRY & MCGINTY.

PUBLICATIONS RECEIVED

SUPRASPECIFIC GROUPS OF THE PELECYPOD FAMILY CORBULIDAE, by Harold E. Vokes (Bull. Amer. Mus. N. H., vol. 86, pp. 1–32, 4 plates, 1945). The numerous groups, generic or subgeneric, are defined by diagnoses of the type species and compared, the types figured so far as practicable. *Corbulomima* and *Ursirivus* are new. *Erodona* and *Ostomya* are removed from the Corbulidae. There is little to criticize in this timely study; but it must be admitted that the name *Corbula* cannot be retained unless it be dated from the plate of Bruguière, which Winckworth has considered inadmissible, since according to the International Rules, Article 25, a name to be available has to be "accompanied by an indication, or a definition, or a description," and a figure is not considered to be "an indication."[1] The next use of the name, according to Vokes, was by Röding (Mus. Boltenianum, 1798) whose *Corbula* is now a synonym of *Asaphis*. Dr. Vokes retains *Corbula* Lamarck, 1799, by considering the Boltenian names "not available," but the International Commission decided otherwise (Opinion 96). The rational way out of this impasse is to accept Bruguière's figures as "a definition" within the meaning of Article 25 of the International Rules. To hold that a figure is not an "indication" seems to be a decision of questionable sagacity; but we can remain within the letter of the law by insisting that a *figure* can be a perfectly satisfactory "definition." In fact it is usually better than a dozen lines of Latin.—H. A. P.

[1] Cf. also, Opinion 1 and Hemming's interpretation thereof.

FIGS. 1–3, *Occnebra interfossa clathrata*; 4–6, *O. minor*; 7–9, *O. i. atropurpurea*; 10–11, 14, *O. i. interfossa*; 12, 15–16, *O. beta*; 13, *O. squamulifera*; 17–18, *O. keenae*.

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A SURVEY OF SOME WEST AMERICAN OCENEBRAS, WITH DESCRIPTION OF A NEW SPECIES

By MARY BORMANN, Long Beach, California

There has been considerable difference of opinion among West Coast conchologists as to the validity of certain species and subspecies of the Ocenebras. In part this has been because of inadequate original descriptions, lack of materials for comparison, and variations within the species from place to place along the coast. The present study is an attempt to clear up some problems relating to several forms that have been associated with the common and variable West American species *O. interfossa* (Carpenter).

Ocenebra Gray, 1847

Ocenebra Gray. Proc. Zool. Soc. London for 1847, p. 133, Nov. 10, 1847.

Ocinebra Leach, 1852. A Synopsis of the Mollusca of Great Britain, p. 117 (*fide* Winckworth).

"*Tritonalia* Fleming, 1828" of Dall, 1908, Bull. Mus. Comp. Zool. Harvard, vol. 43, no. 6, p. 313; not of Fleming.

Type (by original designation), *Murex erinaceus* Linné; European seas, Recent.

Shell generally small, purpuriform, with many varices, which may be foliated or spinose; spiral sculpture generally present; anterior canal partly or nearly closed. (Grant and Gale, Mem. San Diego Soc. Nat. Hist., vol. 1, 1931, p. 708.)

Reasons for the use of the name *Ocenebra* instead of *Tritonalia* have already been given by Winckworth [1] and others and need not be repeated here.

[1] Winckworth, R. Jour. Conchology, vol. 20, no. 1, 1934, p. 14. Also summarized in the Minutes of the Conchological Club of Southern California, no. 51, p. 44, for August, 1945 (John Q. Burch, editor).

Ocenebra interfossa interfossa (Carpenter), 1864. Pl. 4, figs. 10–11, 14.

Ocinebra interfossa Carpenter. Suppl. Rept. Brit. Assoc. Adv. Sci. for 1863, p. 663, August, 1864; Proc. Acad. Nat. Sci. Philadelphia for 1865, p. 64, 1865; figured by Tryon, Manual of Conchology, ser. 1, vol. 2, p. 131, pl. 39, fig. 484, 1880.

Holotype: U. S. National Museum, No. 4636.

Type locality: Monterey Bay (according to holotype label).

Range: Semidi Islands, Alaska to Punta Santo Tomas, Lower California (Minutes Conch. Club, S. Calif., no. 51, p. 48, 1945).

Original description: "Purple-brown, with latticed sculpture." Tryon adds, "Shell narrower and more shouldered [than O. lurida], the lattice of revolving lirae and longitudinal ribs coarser and more elevated; canal short, closed. Length, .4 to .75 in."

In typical *O. interfossa* the shell has a corded or ropy appearance, as the spiral sculpture is more pronounced than the axial. There appear to be about 10 axial and 14 spiral cords on the last whorl in the holotype, but this number may vary considerably from specimen to specimen. The shoulders of the whorls seem more rounded in this subspecies than in any of the other variants of *O. interfossa* discussed here.

Ocenebra interfossa atropurpurea (Carpenter), 1865, Pl. 4, figs. 7–9.

Ocinebra interfossa var. *atropurpurea* Carpenter. Proc. Philadelphia Acad. Sci. for 1865, p. 64, August, 1865.
Tritonalia interfossa atropurpurea Dall, "new subspecies." Proc. U. S. Nat. Mus., vol. 56, p. 334, 1919.

Holotype: U. S. National Museum, No. 15528-b.

Type locality: Puget Sound (Neah Bay, Washington, *fide* Dall).

Range: Neah Bay, Washington to San Diego, California.

Original description: "Costis spiralibus distantibus, in spira duabus, foveis majoribus. Variat. quoque t. albida zonata." A free translation of this would be: Spiral ribs rather distant, two on spire, with large pits. A variety is zoned with white.

Specimens collected at White's Point, Los Angeles County, California, were compared with the holotype by Dr. Harald A.

Rehder. Some have the white bands or zones, some are zoned with orange, and some are ruddy brown without color bands. All show the deep, squarish pits. The name *atropurpurea* is somewhat misleading, as this implies a dark or purplish color. The real difference between typical *O. interfossa* and this subspecies is in the sculpture rather than the color and also in outline, the shoulders of the whorls being more tabulate.

Ocenebra interfossa clathrata (Dall), 1919. Pl. 4, figs. 1–3.

Tritonalia interfossa var. *clathrata* Dall. Proc. U. S. Nat. Mus., vol. 56, p. 334, Aug. 30, 1919.

Holotype: U. S. National Museum, No. 177995.

Type locality: Avalon, Catalina Island, California.

Range (here extended): Puget Sound, Washington, to Redondo Beach, California.

Original description: "This is a short and stout form with very prominent rectangular clathration and flatly turrited spire, which was distinguished by Dr. R. E. C. Stearns in manuscript many years ago but never published. Height, 13; diameter, 7 mm."

O. interfossa clathrata differs from *O. interfossa*, s. s., in the shape of the spire, in the shorter, broader body whorl, and in the proportionately longer canal. Lack of recognition of this subspecies seems due to the fact that type material was never figured. The specimens in figs. 1 and 3 were compared with the holotype by Dr. Bartsch. The distinguishing features of the shell seem to be the tabulate whorls with extremely clathrate sculpture showing squarish pits prominently at the shoulder and on the spire. These pits are not as evident in immature specimens.

Collecting data: San Juan Island, Puget Sound; Little River, Mendocino Co., California; Monterey Bay, shore to 15 fathoms; Piedras Blancas; Cayucos (Allyn Smith; Bormann); dredged off Redondo Beach (Burch).

Ocenebra beta (Dall), 1919. Pl. 4, figs. 12, 15–16.

Tritonalia interfossa beta Dall. Proc. Biol. Soc. Washington, vol. 32, p. 250, Dec. 31, 1919.

Holotype: U. S. National Museum, No. 46728.
Type locality: Monterey, California.
Range: Known only from the type locality.

Original description: "Shell resembling *T. barbarensis* Gabb but stouter and without the recurved spines at the shoulders; reddish brown, of more than 5 whorls, the nucleus defective, the whorls somewhat turreted by an angular shoulder; axial sculpture of (on the last whorl 6 including the terminal varix, on the penultimate whorl 7) angular ribs, prominent at the shoulder and extending to the canal; these are crossed by about 14 densely imbricate spiral cords, subequal and equally spaced, with narrow interspaces; terminal varix heavy. Aperture small, the margin continuous, the outer lip with 4 or 5 low denticles internally, the pillar smooth, the canal closed, rather short."

This form has not hitherto been figured. As *O. beta* appears to be closer to *O. barbarensis* and *O. squamulifera* than to *O. interfossa,* it seems best here to consider it a distinct species. Specimens hitherto identified as *O. beta* by Southern California collectors represent a different species, the *O. keenae* of this paper.

There has been quite a bit of discussion as to how closely *O. beta* and the shells we were calling *O. squamulifera* are related, and as to whether *O. squamulifera* is represented in the recent living fauna. I do not have the material for the necessary survey at this time and the purpose of introducing the photographs of the holotypes, *O. beta* fig. 15 and *O. squamulifera* fig. 13, is for comparison only with the new species *O. keenae.*

Ocenebra keenae Bormann, new species. Pl. 4, figs. 17–18.

Shell brown, often banded with white or buff, of medium size, somewhat turreted, whorls 5; sculpture of 6 to 7 axial ribs crossed on the last whorl by numerous spiral cords, one strong cord at the shoulder, about 7 weaker ones above, about 10 major and 7 minor cords below; whorls tabulate, intersection of axial and spiral sculpture forming blunt spines; area above shoulder with imbricate sculpture on last two whorls; spire with two principal and one to two intercalary cords; aperture white, ovate; outer lip flaring, thick, with 5 to 7 denticles within; apertural varix frilled; canal moderately long, straight, closed.

Holotype: Stanford Univ. Paleo. Type Coll. No. 7915; paratype, No. 7916. Additional paratypes to be deposited in United

States National Museum; Academy of Natural Sciences of Philadelphia; California Academy of Sciences; San Diego Museum of Natural History; Los Angeles Museum; and in the private collections of Allyn G. Smith, Emery and Elsie Chace, A. M. Strong, John Q. and Tom Burch, and Ralph and Mary Bormann.

Type locality: White's Point, Los Angeles County, California.

Dimensions: Height, 19 mm., diameter, 10.5 mm., height of body whorl, 12 mm.

Range: White's Point (Bormann) to Imperial Beach, California (Burch).

This shell has been incorrectly identified as *O. interfossa beta* by Southern California collectors, but there are consistent differences in proportion and sculpture, *O. keenae* having a shorter spire, a larger aperture, and more strongly imbricate sculpture. It does not seem to be closely related to *O. interfossa*. It somewhat resembles *O. foveolata*, but the imbricate sculpture on the tabulate part of the last whorls and the much smaller size separate it from that form.

I take pleasure in dedicating this species to Dr. Myra Keen, of Stanford University, who has done so much to further the study of conchology and has been of great help in interesting others to carry on the work.

Ocenebra minor (Dall), 1919. Pl. 4, figs. 4–6.

Tritonalia interfossa minor Dall. Proc. U. S. Nat. Mus., vol. 56, p. 334, Aug. 30, 1919.

Holotype: U. S. National Museum, No. 56912.

Type locality: Catalina Island, California.

Range (here extended): Catalina Island, California, to Todos Santos Bay, Lower California.

Original description: "This is a pale dwarf, slender form, also from Catalina Island, which seems nevertheless to have reached maturity. It is strongly clathrate and measures in height, 7, and in diameter, 3.5 mm."

This description seems to me incomplete, and I should add: Shell creamy white with brown bands on most specimens; whorls usually 5 in addition to the nucleus; a distinct constriction separating the body whorl from the canal; lip a little thickened in-

ternally, with no denticulations, but with slight grooves corresponding to the revolving lirae of the outside.

Upon the advice of Mr. Allyn Smith I have ranked *O. minor* as a distinct species. He says (letter dated Jan. 28, 1946): "The shape of the shell, configuration of the body whorl, and the general lack of the squamose sculpture that is typical of *interfossa* would seem to be enough to set *minor* off as being different, and I would be inclined to take it out from *interfossa*."

Dr. Myra Keen writes (letter dated Sept. 27, 1945) that specimens of *O. minor* in the Stanford Collection, from San Diego, were identified by Dr. Philip Carpenter for the collector, Henry Hemphill, as a new variety of *interfossa*. However, Carpenter did not publish the name he applied, and it was later used by Dr. Dall for another variant.

Collecting data: Catalina I. (Smith, Chace); White's Point, Los Angeles Co. (Bormann); San Diego, California, and Todos Santos Bay, L. Calif. (Hemphill, in Stanford Univ. Coll.).

In closing, I wish to acknowledge the generous help I have received from many persons. Dr. Paul Bartsch and Dr. Harald A. Rehder have compared my specimens with the types in the U. S. National Museum collection, and Dr. Bartsch has supplied the photographs of several holotypes. Dr. Myra Keen has read and criticized the manuscript and has verified the references. Mr. Allyn G. Smith gave much valuable advice on the relationships of the various species; Mr. and Mrs. E. P. Chace and Mr. John Burch helped me in the early stages of preparing the paper; and, not least, I am grateful to my husband, Ralph Bormann, for making possible the collecting trips that were the real basis of the study. Photographs, except for those from the National Museum, are by Mr. Hubert A. McClain of the *Press Telegram* of Long Beach, California.

Explanation of Plate 4

Unless otherwise stated, all specimens are in the Bormann Collection. All magnifications × 2.

Figs. 1–3. *Ocenebra interfossa clathrata.* 1, 3, Hypotypes, Cayucos, California. 2, Holotype, U.S.N.M., No. 177995.

Figs. 4–6. *O. minor.* 4, 6, Hypotypes, White's Point, Calif. 5, Holotype, U.S.N.M., No. 56912.

FIGS. 7–9. *O. i. atropurpurea.* 7, 9, Hypotypes, White's Point, Calif. 8, Holotype, U.S.N.M., 15528-b.
FIGS. 10, 11, 14. *O. i. interfossa.* 10, Holotype, U.S.N.M., No. 4636 11, 14, Hypotypes, Piedras Blancas, Calif.
FIGS. 12, 15–16. *O. beta.* 12, 16, Hypotypes, Burch Collection, Monterey Bay, Calif. 15, Holotype, U.S.N.M., No. 46728.
FIG. 13. *O. squamulifera* (Carpenter in Gabb). Holotype, Univ. Calif. Mus. Paleo., No. 15459; Pleistocene, Santa Barbara, Calif.
FIGS. 17–18. *O. keenae,* n. sp. 17, Holotype, Stanford Univ., No. 7915. 18, Paratype, No. 7916; White's Point, Calif. R. and M. Bormann, collectors.

LIGUUS PICTUS REEVE

BY PAUL L. AND THOMAS L. MCGINTY

In 1842, Lovell Reeve published a description of a beautiful tree shell which he called *Achatina picta,* the "painted" snail. Although the collector was not named, the habitat was given as "Cuba." So rare was the species, now placed in the genus *Liguus,* no subsequent findings with specific habitat were reported until 1907, when Dr. Henry A. Pilsbry took one specimen, quite typical, on Big Pine Key, the largest of the Lower Florida Keys. A year or so later, Dr. Charles T. Simpson, collecting upon the same island, discovered another specimen. It appears that these two shells, neither found alive, form the only authentic records, with definite habitats, of the actual finding of *Liguus fasciatus pictus.*

Henry Hemphill, a superb collector, hunted extensively over the Keys in 1883 but failed to report finding any of these shells. Charles T. Simpson, an ardent *Liguus* collector, began his search as early as 1885, but found no indication of *pictus* prior to the Pilsbry discovery, although both he and Pilsbry had suspected that it might eventually be taken in Florida. Dr. Carlos de la Torre, eminent Cuban naturalist, has spent years in a systematic search through Cuba, but so far as we know, typical *pictus* has not been found there.

Despite its extreme rarity, the paradox remains that a number of the older museum collections contain a modest series of these shells. In most instances such ancient specimens lack complete habitat data, or the labels simply indicate "Cuba."

During May, a group which included Mr. Jay A. Weber, Miss Maxine Mettlach and the writers, visited Key West. Acting

upon the suggestion of Mr. Weber, our party visited the old cemetery which is situated upon a part of what was once the KeyWest Hammock, long since destroyed. Mr. Weber informed us that during a previous visit, he and Mr. Richard F. Deckert had found, about recently dug graves, bleached "bones" of *Liguus*. Briefly, members of the party took a number of *Liguus* fragments, some still showing color. At first we suspected that these shells represented the *graphicus* form, but a careful comparison with specimens of both *graphicus* and *pictus* showed that we were in error. While none could be positively attributed to *graphicus,* the coloration of two fragments was distinctly that of *pictus!* Other fragments, possibly *pictus,* are bleached to the point where positive identification is impossible. Also, in the lot were specimens which we attribute to *Orthalicus reses,* another form of tree-snail at one time rather widely distributed throughout the Lower Keys. As a result of our findings we feel certain that *pictus* once lived in this Key West Hammock, and to judge by the evidence presented, it appears to have been fairly abundant.

It is our suspicion that a large portion, possibly all, of the ancient *pictus* now in museum collections were originally taken from this locality. It must be recalled that Reeve, who described *pictus* in 1842, was closely associated with Hugh Cuming,[1] a remarkable person and incomparable collector, but now known to have been extremely careless about locality data for his specimens. In fact, a century ago, the name of the species was considered of paramount importance, while habitat, although of interest, was thought to be of no serious consequence. We believe that Reeve was misinformed when he gave Cuba as the habitat for his type of *pictus.* Furthermore, we suspect that the persistence of the locality "Cuba" upon old museum specimens results from a perpetuation of this error.

Unfortunately, historical data regarding early collectors in this region of the Lower Florida Keys is very meager. Only one man is known, with a reasonable degree of certainty, to have visited and collected in the old hammock at Key West. This was Titian R. Peale, an artist and naturalist from Philadelphia,

[1] Clench, Occasional Papers on Mollusks No. 3, 1945, Mus. Comp. Zoology.

who wrote in his diary for February 21, 1825, at Key West: "collected land shells which we found in great abundance on the trees, some of them very handsome." [2] During that same year Thomas Say described as a new species [3] one of the specimens of *Liguus* which must have comprised this lot. Strangely, Say's specimen was a mis-shaped abnormal shell, and it is difficult to explain its use as the type had a series of specimens been available. It seems likely that Say's choice was influenced by the fact that but a single specimen came into his hands. Obviously, from the diary quotation, more than one shell was collected, but we have no means of learning about the final disposition of other possible specimens. Furthermore, the inference "some of them very handsome" seems to indicate that not all of the shells were alike. We believe that the "handsome" ones could very well have been *pictus*. To strengthen this conclusion, we might state that the type specimen used by Say was a faded, almost colorless shell, which could hardly have been considered a thing of beauty.

Nearly a quarter of a century later, Dr. Amos Binney is known to have sent a collector named Bartlett to Florida. Apparently the venture was a great success for Binney later figured a number of Florida *Liguus,* some of them forms found in the vicinity of Miami, and others with habitat given as the Lower Keys. Figured in this latter group were *pictus* and *solidulus*. Since none of the *graphicus* form was figured, we feel reasonably certain that Bartlett did not reach the area around Big Pine Key. It is logical to assume that he concentrated his collecting endeavors about Key West, the principal community in the region. We believe it likely that he found his specimens of *pictus* in this same old Key West Hammock.

While others may possibly have collected *pictus* in the early days, further information regarding collectors seems non-existent.

In conclusion, we believe that *pictus* is definitely a Florida shell and that the typical form has never been found in Cuba,

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[2] Pilsbry, Jour. Acad. Nat. Sci. Phila., 1912.

[3] *Achatina solida* Say, now *Liguus fasciatus solidus.* This was the first Florida *Liguus* to be described.

although a closely related *Liguus* may possibly live there. Further, from the indications, we suspect that the old hammock in Key West was the principal habitat for this apparently extinct snail, and the source from which most of the museum specimens were obtained.

A NEW FLORIDA STROMBUS, S. GIGAS VERRILLI

By Thomas L. McGinty

Mr. Alpheus Hyatt Verrill, naturalist, author and artist, has turned up a *Strombus* which in youth has characters of both *S. gigas* and *S. costatus,* but in the adult stage is nearer to the former. We are calling it:

Strombus gigas verrilli. Plate 5, figs. 2, 3; plate 6, figs. 7, 8.

It is shorter and chunkier than *gigas.* In the larger immature and the adult shells the general form and proportions resemble *costatus* more than *gigas.* In the younger shells the resemblance is still stronger, many being indistinguishable from *costatus* except by the number of spines, the young *costatus* usually having from 12 to 16, whereas *verrilli* has from 9 to 11. *S. gigas* in all stages never has over 7 spines, the average being 5. In nearly all cases the spines are far shorter and more obtuse than in *gigas.* In the majority of the larger immature specimens, and in all the adults, the first three or four spines are reduced to small rounded tubercles or slight projections and in many specimens all the spines are mere tubercles. In a few specimens one or more of the spines on the last whorl may be almost as long as in *gigas* but are stouter, more curved and more obtuse, much like the spines of some specimens of *costatus.* Canal sharply upturned and swollen. Several conspicuous irregular tubercles on dorsal surface.

In color these shells are very variable, especially in the younger specimens. The general color varies from almost pure white through lemon yellow to violaceous, rose, ochreous to brown. Most of the younger specimens and many of the larger shells have the spines marked with rich brown as in *costatus.* Interior surface of lip usually yellowish shading to pink or violaceous. Column varying from white to rose pink or violaceous with polished area marked with reddish brown and a blackish area. Many specimens are striped longitudinally with brown on an ashy ground while others may be banded horizontally with several shades of brownish. In specimens having the in-

terior of lip pink the color is usually restricted to the marginal area.

The animal differs from *gigas* in being largely orange with the darker portions olive marked with spots or rings of yellow. Mantle varies from deep yellow to orange with a black border.

The difference between these shells and *gigas* (in all stages of growth) may best be seen by viewing them end on. The very distinct difference in the spacing of the spines is at once apparent even in those specimens having the fewest spines or tubercles.

There appears to be some difference in the operculum, that of *gigas* averaging more slender, more curved and more pointed than in these shells.

The shells were first found, Nov. 24, 1945, in a mangrove swamp near the north end of Lake Worth and, as far as known, have not been obtained elsewhere. They apparently are restricted to a small area, about half an acre in extent, and diligent search has not revealed their presence outside of this area. Neither have they been located in deep water, all specimens observed or collected having been in water less than three feet in depth. Many have been found in water so shallow that it barely covered the shells. The notes following were mainly supplied by Mr. Verrill.

In their habits they differ markedly from *S. gigas* for while *gigas* lives fully exposed upon sandy or muddy bottoms, *verrilli* lives buried in mud on a grassy bottom, although often with the upper portion of shell exposed, and when feeding they are almost fully exposed. The larger immature, and the adult specimens are usually overgrown with large masses of algae which serve still further to conceal them.

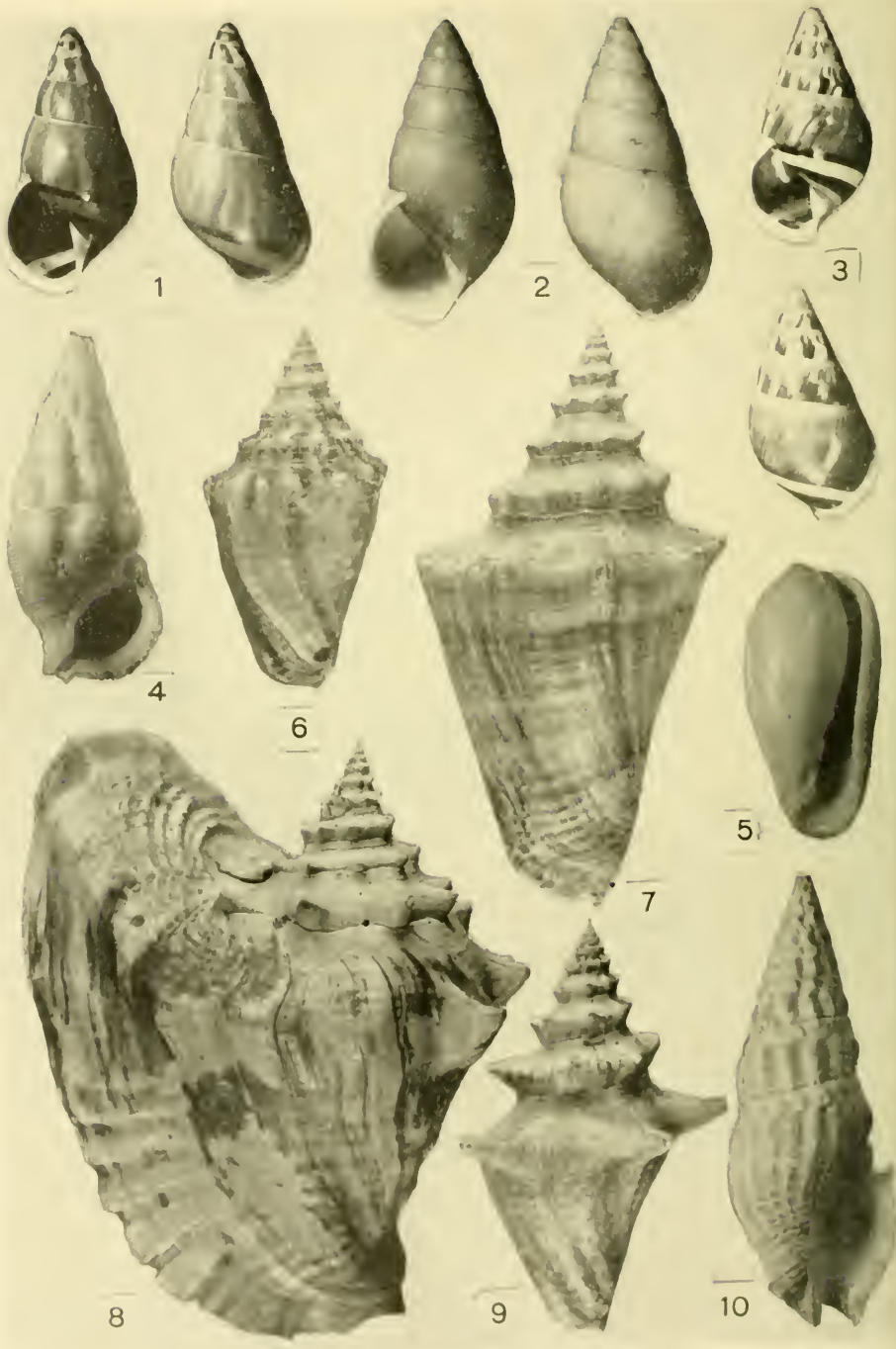
In all of our collecting in the area inhabited by these shells we have never found a specimen of *S. costatus,* nor a typical specimen of *S. gigas.* There is, however, a considerable variation in our large series of specimens, both in the length of the tubercles, the colors and the forms. Some individuals have spines almost as long as typical *gigas,* others may have one large spine with the others merely small knobs, still others may have only small tubercles while still others may have only indications of tubercles. In every case, however, they are readily distinguished from *gigas* by the number of tubercles in each whorl. Whereas *gigas* has from five to seven of these, *verrilli* has from

nine to eleven, while *costatus* has from *twelve to fourteen* (but exceptionally only 9 on the last whorl). In the adults the tubercles are difficult to detect on the surface of the flaring lip and for this reason they resemble *gigas* more than do the immature and young specimens. The smaller, younger ones resemble *costatus* more than *gigas,* but are readily distinguished by the number of tubercles and usually by color, although, as previously stated, the colors in all stages are very variable. Some specimens (when epidermis is removed) are almost pure white, others are distinctly banded with ochreous-brown on a lighter ground, others are mottled with various shades of brownish, others are longitudinally striped; some specimens are quite pink or rosy throughout, still others are pale orchid or lilac, while others are rich yellow. In every case, however, there are rich sienna markings on the column near the lip together with patches or areas of black. In many the columellar callous surface is nearly as pink as in *gigas,* but in others there is no trace of pink. The inner surface of the lip also varies, some showing no pink suffusions, others being decidedly pink, others yellow, while in a few adults the entire inner surface of the lip is richly opalescent with lavender and mauve predominating. As a rule, too, each of the spiracles is tipped with sienna or chestnut-brown, this being particularly apparent in the younger specimens. The color of the animal is also quite distinctive. The anterior dorsal portion is olive or greenish-gray mottled and spotted with yellowish-white or pale yellow, tips of tentacles golden yellow, mantle and posterior portion of body rich orange, foot pinkish-gray.

Sex appears to have no bearing on the size of the shells, some of the smallest adults being females while most of the larger adults examined have been males.

Although the adult specimens average much smaller than the adult specimens of *gigas* a few very ancient, almost fossilized specimens, found buried approximately two feet beneath the surface of the mud, are fully as large as the average adult of *gigas.* The presence in considerable numbers of these ancient shells, typically *verrilli,* would indicate that this particular, restricted area has been inhabited by them for a very long period of time.

FIG. 1, Strombus gigas, animal extended, and 2, Strombus gigas verrilli, drawn from life by A. Hyatt Verrill. 3, S. gigas verrilli, apical view of young x $\frac{8}{5}$ (= pl. 6, fig. 7). 4, S. gigas (= pl. 6, fig. 9).



Figs. 1–3, Bartsch: new Amphidromus. 4, 5, 10, M. Smith: new shells. 6, Strombus costatus, Young. 7, 8, S. gigas verrilli. 9, S. gigas. Figs. 6, 7, 8, 9 from specimens 75, 124, 200 and 88 mm. long.

THE CLASSIFICATION OF CYPRAEIDAE

By Jacques R. Helfer, Mendocino, California

The results achieved by an author attempting a classification of cowries, or of any group of living things for that matter, will necessarily depend largely upon the concept of categorical limitations which he develops and applies to the forms under consideration.

The reason for our difficulties is twofold. First, there is the fact that the various fissions of primitive species into assorted modern species have taken place at different times, and are taking place now, and that the subsequent changes wrought upon the modern species by the forces of evolution have varied both in direction and in intensity. Secondly, as the immortal Francis Bacon has pointed out: "There is one principal and as it were radical distinction between different minds, in respect of philosophy and the sciences; which is this: that some minds are stronger and apter to mark the differences of things, others to mark their resemblances. The steady and acute mind can fix its contemplations and dwell and fasten on the subtlest distinctions; the lofty and discursive mind recognizes and puts together the finest and most general resemblances. Both kinds, however, easily err in excess, by catching the one at gradations, the other at shadows."

As a result of this state of affairs dozens of systematic categories have been erected in the literature of natural science, some useful, others seemingly only encumbrances. A list of these includes such little known and picturesque names as: cohort, jordanon, and legion, morpha, phalanx, and proles, supertribe and supervariant.

In the Schilders' "Prodrome of a Monograph on Living Cypraeidae," 1939, the most recent comprehensive publication on cowries, eleven categories are employed. These are: family, subfamily, tribe, genus, subgenus, superspecies, species, subspecies, race, ecotype, and variant. Ecotypes are further subcategorically defined by them as: major (large), minor (small), oblonga (oblong), dilatata (heavy and callous), rostrata (with the extremities produced), pellucida (thin), pallida (pale), saturata (richly colored), confusa (dorsal markings confluent),

and suffusa (with a suffusion of an unusual color in the ground color). Different stages of growth are also differentiated subcategorically by the Schilders as: adulta, subjunior, junior, juvenis, perjuvenis, oliviformis, and pulla.

The Schilders and Mr. T. Iredale, among our recent authors, are notable members of the school of thought often referred to as the "splitters" because of the facility with which they discover differences among various closely related forms. There is also a more cautious school of thought, with its notable adherents, which prefers to live less dangerously and to lump closely related forms together under a single name. From this habit of theirs comes their name, the "lumpers."

Strictly speaking, a genus is defined as a group of closely related species, all presumably descendents of a common ancestral parent species. The members of any given generic group are recognized in practice by their having certain structural characteristics in common. When an author discovers that certain structural characters are common to a group of species, he may pronounce that group a genus. But if a subsequent author discovers other structural characters common to a certain group of species within the established genus and pronounces these new characters to be generic in value, who can say which is right? A genus is thus seen to be artificial in the sense that it is to a large extent opinionative. Its scope or comprehension varies directly with the viewpoint of the author and usually with the number of authors who have studied it. The genera of today have a tendency to become the subfamilies of tomorrow in the literature of the splitters. The size of a genus is often best dictated by utilitarian considerations.

Abuse of the free privilege of erecting generic groups in scientific literature relating to cowries has resulted in considerable confusion and often in very material abrogation of the usefulness of the generic concept. Where thousands of species exist in a single family, many genera are useful in breaking down such an unwieldly group into smaller, more manageable groups. Where there are only a hundred or so of species to be dealt with it is not necessary to introduce very many generic divisions in order to bring all the species within ready taxonomic comprehension and to show their interrelationships.

One is easily led to the conclusion that many of the excessive number of genera in the Cypraeidae are not natural groups of generic importance at all, but only undisciplined and ill-considered writings of over-enthusiastic apprentices to the study of natural science, catering to childlike desires to cause their surnames to be associated with what are already sufficiently magnificent works of natural art. To these one might well say:

> Beware, O thou neophyte, that thou be not hypnotized
> By too long gazing at the cowry's shining colors,
> Lest thy pen write mockeries of reason.

But aside from considerations which may be termed opinionative, we have definite scientific standards by which to judge the work of authors writing on scientific subjects. There are well defined rules designed to regulate and standardize the work of students which must be closely adhered to. Moral integrity is the only regulator on the writing of authors where opinionative subject matter is concerned but questions of systematic taxonomy may be judged by definite written laws, and violators of these laws are to be detected and ruthlessly criticized. Otherwise their unchecked and unchallenged activity results in endless confusion and burdensome synonomy in literature.

In this respect I wish to call the attention of the student of Cypraeidae to one of many comparable items to be found in the works of Mr. T. Iredale. He writes: (Aust. Zool., vol. VIII, Pt. II, 28 June, 1935, p. 100).

"Cleotrivia bathypilula nom. nov. (1918. *Trivia globosa*, Verco, Trans. Roy. Soc. S. Austr., vol. XLII, p. 150, 40–80 fathoms, South West Australia.) This deepwater shell is narrower and less elevated than the so-called *pilula* of the east coast, and, of course, it cannot be called *globosa* in any sense." Elsewhere I have noted Iredale saying: "My own taxonomic knowledge enables the suggestion of some alterations," reflecting his opinion of his own work.

In International Rules of Zoological Nomenclature we read: "Rejection of Names, Article 32.—A generic or a specific name, once published, cannot be rejected, even by its author, because of inappropriateness. Examples: Names like *Polyodon*, Apus,

albus, etc., when once published, are not to be rejected because of a claim that they indicate characters contradictory to those possessed by the animals in question."

The name *Cleotrivia bathypilula* Iredale thus becomes a synonym of *C. globosa* Verco.

The Schilders, with typical German thoroughness and attention to detail, have brought together between the covers of their *Prodrome* a mass of information on cowries which is next to useless to beginners as an aid to identification, but valuable, notwithstanding, to the advanced student. Their charts and other distributional data are especially useful. They are typical splitters, however, and as a result their classification will have only a limited appeal. For example, their action in splitting the forms of Troschel's genus *Monetaria* into two subgenera seems totally unwarranted in view of the close relationship between the two species involved. The ultimate unconscious aim of splitters seems to be to finally erect a separate genus for each species.

In rebuttal to arguments of the lumpers, an author or student favoring much multifarious subdivision may well reply, in kind, that if he encounters criticism of such a system, this criticism will come only from superficial amateurs for whom the distinction of the one genus *Cypraea* is sufficient. It is, as we can readily see, partly a question of one's point of view.

Apparently it is a common feature of that vast confusion of unrealistic cross-purposes and half-expressed strivings humorously called human nature, to wish to separate extraordinary specimens in private collections as named forms. While many of these varieties, especially of color, recur frequently, it is unfortunately true that long series from the same reef show all intergrading variations also recurring frequently and, since modern taxonomy does not permit us to anticipate evolutionary processes, we should resign ourselves to keeping our prized varieties without particular names.

Doubtless the truth lies somewhere in between the viewpoints of the lumpers and splitters. Such a result may be obtained by considering the genera of the splitters as subgenera, discarding their subgenera or treating them as species, placing certain species and races as subspecies of other forms, and minimizing

the importance of variations whether they be general or ecological, in short, by systematically devaluating the categories of the splitters.

DISPERSAL OF SHIPWORMS IN THE PACIFIC

By C. H. Edmondson, Bishop Museum, Honolulu

Since a report by the author on the dispersal of shipworms among central Pacific islands was published,[1] additional material has come to hand which confirms the belief that certain common species of marine wood borers are widely distributed through the Pacific area.

By the courtesy of personnel of the United States Navy specimens and material have been received from Okinawa and from Guam representing a number of species of *Teredo* familiar in the central Pacific.

Teredo gregoryi Dall, Bartsch and Rehder. Collected by J. T. Conover from timbers of a Japanese fishing boat wrecked on the west shore of Okinawa. Shells only were recovered. The distinctive characters of the shell of this species leave no doubt about the determination of the specimens. This well known form, typical of drift logs, is common about Hawaii and has previously been taken as far west as Wake Island and as far south as Canton Island. In Hawaii it has become established in wooden structures about the shores and is known to be one of the active species in the lagoon at Midway Island.

Teredo trulliformis Miller. Shells and pallets recovered.

Teredo diegensis Bartsch. Shells, pallets and living specimens recovered.

Teredo fulleri Clapp. Pallets only recovered.

Teredo bensoni Edmondson. Pallets only recovered.

Representative parts, and in one instance living specimens, of these four species, all widely distributed in the central Pacific, were recovered from a drift timber 3″ in diameter (length un-

[1] Dispersal of Shipworms among Central Pacific Islands, with descriptions of new species, B. P. Bishop Mus., Occ. Papers, vol. 18, no. 15, pp. 211–224, 1946.

known) taken from the vicinity of Agana, Guam, by K. V. Bossler. The species of drift wood infested was undetermined and its source is unknown. From the presence of living marine borers in it, however, there is a strong assumption that if species of these shipworms were not already established in that locality they would be in a short time.

In late years, immediately preceding, during and following the recent war, there has been greatly increased activity of light, wooden hulled craft in the Pacific. The appearance at Okinawa and Guam of marine wood borers well known in the central Pacific gives credence to the belief that light wooden vessels are means by which shipworms have been so widely and probably so recently dispersed.

A personal communication from the Hawaiian Dredging Company, Ltd., of Honolulu, states that wooden hulled barges, scows, tugs, and other such floating equipment were moved by that company and its associates to and between Hawaiian Island ports and Midway, French Frigate Shoals, Canton, Palmyra, Wake and Johnston Island during the period from 1939–1944. Wooden hulled craft were also built for use in Guam.

A LIST OF MARINE MOLLUSKS FROM THE ADMIRALTY ISLANDS

By R. A. McLean and C. H. Hebert

While stationed in the Admiralty Islands in 1944 and 1945 the senior author made a small collection of marine mollusks. As records from this area are few it seemed worth while to record these species from the geographical locality where they were taken.

The bulk of the lots were collected at Koruniat Island, Seeadler Harbor, Manus. A few came from Ponam Island about 25 miles west of Lorengau on the Island of Manus and these are indicated in the text.

The nomenclature employed is that of Tryon's Manual of Conchology, Reeve's Conchologica Iconica and other works of about that vintage.

GASTROPODA

Haliotis varia Linnaeus.
Subemarginula tricarinata Born.
Patella stellaeformis Reeve.
Stomatella elegans Gray.
Gena lutea A. Adams.
Stomatia phymotis Helbling.
Stomatia phymotis obscura Lamarck.
Chrysostoma paradoxum Born.
Euchelus foveolatus A. Adams.
Trochus fenestratus Gmelin.
Trochus maculatus Linnaeus.
Trochus niloticus Linnaeus.
Delphinula laciniata Lamarck.
Astraea petrosum Martyn.
Turbo artensis Montrouzier. (Ponam I.)
Turbo intercostalis Philippi.
Turbo petholatus Linnaeus.
Turbo nivosus Reeve.
Nerita plicata Linnaeus.
Nerita polita Linnaeus.
Theodoxus neglecta Pease. (Ponam I.)
Littorina undulata Gray.
Littorina scabra Linnaeus.
Cerithium aluco Linnaeus.
Cerithium alutaceum Gould.
Cerithium fasciatum Bruguière.
Cerithium lemniscatum Quoy & Gaymard.
Cerithium nodulosum Linnaeus.
Cerithium piperitum Sowerby.
Cerithium sinensis Gmelin.
Cerithium vertagus Linnaeus.
Amalthea antiquatus Linnaeus.
Amalthea conica Schumacher.
Cheilea equestris Linnaeus.
Strombus canarium Linnaeus.
Strombus floridus Lamarck.
Strombus gibberulus Linnaeus.
Strombus lentiginosus Linnaeus.
Strombus luhuanus Linnaeus.
Strombus urceus Linnaeus.
Pterocera lambis Linnaeus.
Terebellum subulatum Lamarck.
Polinices mamilla Linnaeus.
Polinices melanostoma Gmelin.
Trivia oryza Lamarck.
Ovula lactea Lamarck.
Cypraea annulus Linnaeus.
Cypraea erosa Linnaeus.
Cypraea isabella Linnaeus.
Cypraea lynx Linnaeus.
Cypraea poraria Linnaeus.
Cypraea tigris Linnaeus.
Cymatium aquatile Reeve.
Cymatium chlorostomum Lamarck.
Gyrineum gyrina Linnaeus.
Colubraria distortus Schubert & Wagner.
Bursa affinis Broderip.
Dolium perdix Linnaeus.
Murex adustus Lamarck.
Thais armigera Lamarck.
Thais hippocastaneum Linnaeus.
Thais persica Linnaeus.
Drupa undata Chemnitz.
Drupa horrida Lamarck.

Sistrum spectrum Reeve.
Coralliophilia neritoides Gmelin.
Iopas sertum Bruguière.
Columbella fulgurans Lamarck.
Columbella pardalina Lamarck.
Columbella punctata Bruguière.
Columbella versicolor Sowerby.
Nassa obtusata A. Adams.
Nassa albescens Dunker.
Latirus craticulatus Linnaeus.
Latirus smaragdula Linnaeus.
Peristernia chlorostoma Sowerby.
Peristernia nassatula Lamarck.
Imbricaria punctata Swainson.
Mitra acuminata Swainson.
Mitra deshayesii Reeve.
Mitra litterata Lamarck.
Mitra olivaeformis Swainson.
Mitra retusa Lamarck.
Mitra tabanula Lamarck.
Turricula exasperata arenosa Lamarck.
Turricula plicaria Linnaeus.
Turricula sanguinisuga Linnaeus.
Vasum ceramicum Linnaeus.
Vasum turbinellum Linnaeus.
Harpa minor Lamarck.
Turris babylonia Linnaeus.
Conus capitaneus Linnaeus.
Conus ceylonensis nanus Broderip.
Conus ceylonensis pusillus Chemnitz.
Conus coronatus Dillwyn.
Conus glans Hwass.
Conus ebraeus Linnaeus.
Conus marmoreus Linnaeus.
Conus miliaris Hwass.
Conus monarchus Linnaeus.
Conus rattus Hwass.
Conus sponsalis Lamarck.
Conus stercus-muscarum Linnaeus.
Conus striatus Linnaeus.
Conus terebra Born.
Conus vitulinus Hwass.
Terebra dimidiata Linnaeus.
Terebra muscaria Lamarck.
Atys cylindrica Helbling.
Atys paralella Gould.
Haminea crocata Pease.
Bulla vernicosa Gould.
Melampus caffra Kuster.
Melampus fasciatus Deshayes.
Melampus luteus Quoy.

PELECYPODA

Arca decussata Sowerby.
Arca fusca Bruguière.
Arca ocellata Reeve.
Arca tenella Reeve.
Glycymeris amboinensis Gmelin.
Spondylus ducalis Chemnitz.
Modiolus tumescens "Dunker" Clessin.
Cardita variegata Bruguière.
Codakia bella Conrad.
Codakia interrupta Lamarck.

Codakia punctata Linnaeus.
Codakia tigrina Linnaeus.
Corbis fimbriata Linnaeus.
Myrtaea fabula Reeve.
Taras vesicula Gould.
Cardium flavum Linnaeus.
Hemicardium fragum Linnaeus.
Hemicardium unedo Linnaeus.
Hippopus hippopus Linnaeus.
Circe sulcata Gray.
Chione marica Linnaeus.
Cytheria reticulata Linnaeus.
Gafrarium dispar Dillwyn.
Lioconcha castrensis Linnaeus.
Mesodesma striata Gmelin.
Paphia grigona Deshayes.
Donax faba Chemnitz.
Tellina ellicensis Hedley.
Tellina obliquelineata Conrad.
Tellina perula Gould.
Tellina rubella Deshayes.
Tellina scobinata Linnaeus.
Tellina staurella Lamarck.

SCAPHOPODA

Dentalium elephantinum Linnaeus.

NOMENCLATORIAL NOTES ON ODONTOSTOMUS BECK, 1837 (BULIMULIDAE)

BY LOTHAR FORCART, Museum of Natural History, Basel (Switzerland)

ALBERS 1850 (p. 150) united in *Odontostomus* Beck the species: *Bulimus odontostomus* Sow., *pantagruelinus* Moric., *exesus* Spix, *ianeirensis* Sow., *punctatissimus* Lesson, *ringens* Dkr., *wagneri* Pfr., *scxdentatus* Spix, *pupoides* Spix, and *dentatus* Wood.

PFEIFFER 1850 (pp. 107–112) divided *Odontostomus* Beck (as used by ALBERS 1850) in *Macrodontes* Swainson, 1840 for *Bulimus odontostoma* Sow. and *Bul. grayanus* Pfr., and *Odontostomus* for *Bul. pantagruelensis* Moric. and 14 other species. MARTENS 1860 (p. 187) designated the genotypes *B. odontostomus* Sow. for *Macrodontes* Swains, and *Bulimus pantagruelinus* for *Odontostomus* Beck. PILSBRY 1898 (p. 57) and PILSBRY 1901 (p. 29 and 39) accepted these type-designations.

But this type-designation for *Odontostomus* is not according with the International Rules on Zoological Nomenclature. In accordance with Art. 30 I d *Bulimus odontostoma* Sow. (which BECK 1837 (p. 54) mentioned as synonym of *O. gargantula*

(= emend. for *Helix* (*Cochlodina*) *gargantua* Férussac, 1821)) is the genotype by tautonomy.

Macrodontes Swainson, 1840, with *Macrodontes sowerbyi* Swainson, 1840 (= *Bulimus odontostoma* Sowerby, 1824) as monotypical genotype, becomes a synonym of *Odontostomus* Beck, 1837.

The genus *Odontostomus* in the sense of Pfeiffer 1850, Martens 1860, Pilsbry 1898 and 1901 must be newly named. Pilsbry 1901 divided *Odontostomus* (not of Beck) in several sections and subgenera. Their oldest name is *Cyclodontina* Beck, 1837, with *Clausilia pupoides* Spix (= *Pupa inflata* Wagner) as genotype, designated by Pilsbry 1898 (p. 57). The older type-designations by Herrmannsen 1847 (p. 344) and Gray 1847 are not valid. Herrmannsen designated two species and Gray a nude name.

The section *Odontostomus* Pilsbry, 1901 (p. 62) with *Helix* (*Cochlodina*) *pantagruelina* Moricand, 1833 as genotype must be newly named. I propose for it *Pantagruelina* subg. n.

So we accept the following nomenclatorial alterations:

New name:
Genus *Odontostoma* Beck, 1837.
Genotype taution.: *Bulimus odontostoma* Sowerby (= *Odontostomus gargantuas* (Fér.)).
Genus *Cyclodontina* Beck, 1837.
Lecto-genotype: *Cyclodontina* (*Cyclodontina*) *inflata* (Wagner); Pilsbry 1898 (p. 57).

Subgenus *Pantagruelina* subg. n.
Genotype: *Helix* (*Cochlodina*) *pantagruelina* Moricand (= *Cyclodontina* (*Pantagruclina*) *labrosa* (Menke)).

Name used by Pilsbry 1901:
Genus *Macrodontes* Swainson, 1840.
Genotype monotyp.: *Macrodontes sowerbyi* Swainson (= *Macrodontes odontostomus* (Sow.)).
Genus *Odontostomus* Beck, 1837.
Lecto-genotype: *Odontostomus* (*Odontostomus*) *pantagruelinus* (Moricand); Martens 1860 (p. 187).
Section *Odontostomus* Beck s. str.
Lecto-genotype: *Odontostomus* (*Odontostomus*) *pantagruelinus* (Moricand); Martens 1860 (p. 187).

Pilsbry 1901 (p. 31) identifies *Helix* (*Cochlodina*) *gargantua* Férussac, 1821 with *Odontostomus* (*Odontostomus*) *pantagruelinus* (Moricand) and not with *Macrodontes odontostomus* (Sowerby) as earlier authors.

This opinion is erroneous, because a picture of *Helix* (*Cochlodina*) *gargantua* Fér., which is identical with *Bulimus odontostomus* Sowerby, was published in Férussac & Deshayes 1820–

1851 (pl. 163, fig. 1). Kennard 1942 (p. 110) pointed out, that pl. 163 was issued by Férussac in livr. 27 (August 4, 1832).

Moricand 1833 (p. 542) writes in the description of *Helix* (*Cochlodina*) *pantagruelina:* "Cette espèce est le géant du sous-genre auquel elle appartient, car elle est d'un tiers plus grande que l'*H. gargantua*, de laquelle elle se rapproche par ses principaux caractères."

Pilsbry 1901 (p. 64) remarked of *Helix* (*Cochlodina*) *gargantua* Férussac, 1821: "insufficient desc." But *Helix* (*Cochlodina*) *gargantua* was at the time of its description the only known species of its group and well defined in form of a synoptical key.

So *Macrodontes odontostomus* (Sowerby) in Pilsbry 1901 (p. 31) must be replaced by *Odontostomus gargantua* (Férussac).

Pilsbry 1901 (p. 63) writes in the synonymy of *Odontostomus* (*Odontostomus*) *pantagruelinus* (Moricand): "*Scarabus labrosus* Menke, Synopsis methodica molluscorum, p. 78 (1828); Second Edition, p. 130 (1830); description insufficient for identification." But there is no doubt that *Helix* (*Cochlodina*) *pantagruelina* Moricand is synonym of *Scarabus labrosus* Menke. Moricand 1833 (p. 543) writes: "Cette coquille est certainement le *Scarabus labrosus*, de Moench (misspelling for Menke). Mais comme d'un côté elle n'appartient pas à ce genre, et que de l'autre j'ai cru devoir en donner une figure j'ai dû la ramener au genre Helix, tel que l'entend M. de Ferussac, et a son sous-genre *Cochlodina;* puisque dans cette note j'ai adopté cette nomenclature, je n'ai pas pu conserver non plus le nom spécifique, vu qu'il existe déjà une *Helix labrosa.* J'ai pensé que le nom sous lequel je la désigne, rappelait sa parente avec l'H. Gargantua, Fer."

The name *Odontostomus* (*Odontostomus*) *pantagruelinus* (Moricand) in Pilsbry 1901 (p. 63) must be replaced by *Cyclodontina* (*Pantagruelina*) *labrosa* (Menke).

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NEW CARIBBEAN AND PANAMIC SHELLS AND A PLIOCENE MARGINELLA

By Maxwell Smith

Cerithium caribbaeum sp. nov. Plate 6, fig. 4.

Shell rather broad, brownish in color especially in front, spire gradually tapering; nucleus smooth, flattened, whitish, shining, consisting of about one and one-half whorls, subsequent whorls seven in number; suture well impressed, slightly channeled below upon the body whorl, decidedly undulating; nine broad, rounded, axial ribs upon each whorl, extending from suture to suture upon the spire, from suture to periphery on body whorl, *not forming short spiny processes,* crossed by numerous, over all, closely placed distinct spiral riblets, the interspaces darker in color; aperture and anterior canal oblique, interior grayish white; anal sulcus rather small, *forming a groove which extends well within the shell;* outer lip slightly crenulate, more extended anteriorly.

Height of shell 31.5, diameter 15 mm.

Habitat: Dredged off Manzanillo Island, Colon, Canal Zone.

Holotype in the writer's collection.

This species is allied to *Cerithium litteratum* Born, but is larger. It lacks the double row of spiny processes so character-

istic of that shell, the aperture is more oblique, the spire more produced and the spiral sculpture entirely different.

The holotype and other specimens, fresh but not living, were collected by Mr. Walter D. Clark.

THAIS CORONATA BRUJENSIS subsp. nov.

Shell of moderate size, elongate, spiny processes feebly developed as compared to African specimens; nucleus well produced, shining, black with often a whitish zone or band; anal sulcus usually straightly indented and simpler than in the typical shell; only slight indications of peripheral nodulations.

Height 45, diameter 29 mm.

Habitat: Bruja Point (Caribbean), Canal Zone.

Holotype in the writer's collection.

Apparently the first record of *T. coronata* in these waters. Collected by Mr. Walter D. Clark.

CRASSISPIRA WALTERI sp. nov. Plate 6, fig. 10.

Shell solid, acute, whitish with a thin yellowish-brown epidermis, aperture pinkish lavender color; nucleus defective in present example, about eight subsequent whorls; suture moderately impressed, more or less undulating between the riblets; fifteen rounded axial ribs upon the penultimate whorl, the ribs being nodulous between the spiral threads (seven threads upon the penultimate whorl, with in addition a more prominent thread in front of the suture and three feeble threads between them); aperture short, wide, the anal sulcus deep, oval, edge well extended and reflected; anterior canal wide, short, the terminal reflected; outer lip thin, the terminations of the spiral threads forming beautiful crenulations, well indented in front of the crenulations; body whorl with a distinct hump upon the back of the shell.

Height of shell 37.5, diameter 18.5 mm.

Habitat: Archipelago de las Perlas, Panama.

Holotype in the writer's collection.

Only a single example was taken by Mr. Walter D. Clark for whom the species is named. Dr. Pilsbry writes that it is very similar to *"Drillia" saulcydianus* Reeluz, but larger. That is said to be from "Senegal." (It is not = *D. umbilicatus* Gray, as Tryon said.)

MARGINELLA FORMOSA sp. nov. Plate 6, fig. 5.

Shell of medium size, long, gradually tapering anteriorly, apex covered with callus but not immersed in the last whorl; terminal varix rather broad, externally marginated; inner edge of outer lip feebly denticulate; aperture narrow posteriorly, widening considerably at anterior end; four distinct but rather fine plaits upon the columella, the anterior one the strongest and obliquely extended to join and form the labrum; surface of shell highly polished and with no trace of color pattern.

When placed upon a plane surface the shape of the outer labrum may best be studied. It swings upward at both of the terminals.

Alt. 21.5 mm.

Habitat: Pliocene, Clewiston, Florida.

Holotype in the writer's collection.

This species is rather similar to *M. burchardi* Dunker from the East Indies but is much smaller and posteriorly the aperture is narrower. Further, in *M. burchardi* the anterior columellar plait is usually bifid. *M. formosa* is a larger shell than *M. labrosa* Redfield, another ally from the Antilles. The latter is relatively a shorter shell and with the anterior penultimate plait the most prominent.

THREE NEW SUBSPECIES OF AMPHIDROMUS VERSICOLOR FROM THE PHILIPPINE ISLANDS *

BY PAUL BARTSCH, Associate, Division of Mollusks,
United States National Museum

The liberation of the Philippine Islands by our armed forces has again made possible communication with the veteran collector, Pedro de Mesa of Lubang Island, whose family has been subjected to dire hardships and mistreatment by the Jap invaders. Undaunted he is again picking up the scattered threads and intends to continue his exploration of the islands for mollusks. A present sending contains three new races of the genus *Amphidromus* which are here described.

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AMPHIDROMUS VERSICOLOR DEMESAI, new subspecies. Plate 6, fig. 3.

Shell ovate, sinistral, with a dark apical spot succeeded by a flesh-colored whorl or two, which in turn are succeeded by a series of narrow, fairly equally spaced, slightly wavy, axial, brown lines which become fused on the anterior half of the turns. On the posterior half these are separated by spaces about as wide as the brown lines. These markings pass obliquely across the lines of growth. The last three whorls bear a red or yellow zone at the summit. The ground color of these whorls is greenish yellow. The last turn may be greenish yellow or in addition to that show the axial paler lines of the posterior half and larger yellowish spots on the anterior half. The base bears a broad yellow median spiral band anterior, and posterior to which an equally broad darker spiral band may be present or these may be absent, and the shell merely continues the coloration posterior to the periphery. The columellar area behind the peristome is red, while the reflected peristome is white with the interior livid, showing the external markings within.

Fifteen specimens were collected by de Mesa on the north and northeast tip of Coron Island in the Calamianes group. These yield the following measurements:

	No. of Whorls	Length in mm.	Diameter in mm.	
1	6.5	34.0	18.7	
2	6.4	30.9	16.5	(type)
3	6.7	32.8	16.3	
4	6.6	33.5	17.6	
5	6.5	32.9	17.8	
6	6.1	29.4	16.4	
7	6.8	36.0	18.1	
8	6.4	28.9	16.1	
9	6.4	29.5	16.0	
10	6.3	30.3	17.0	
11	6.8	33.8	16.3	
12	6.5	35.0	18.2	
13	6.0	30.6	16.6	
14	6.5	31.0	16.0	
15	6.6	34.1	17.1	
Greatest	6.8	36.0	18.7	
Average	6.47	32.1	16.9	
Least	6.0	28.9	16.0	

No. 2 of these is the type. It is registered as U.S.N.M. No. 542919. The rest of the specimens bear the U.S.N.M. No. 542920.

In the possession of the red band below the summit, this subspecies suggests an occasional occurrence of that feature in the mass of variants of *versicolor* from the Island of Balabac. Here, too, occasionally one sees the red zone behind the columella. The rest of the coloration, the yellow band on the middle of the base, and the axial markings suggest more nearly *versicolor everetti* from Brooks Point, Palawan, but the quite uniform olivaceous ground color differentiates it from that subspecies at once, in which the ground color is uniformly brownish. It resembles *Amphidromus versicolor aborlanensis* in general respect but can at once be distinguished by its red subsutural zone, brighter red coloration of the columellar area as well as general tone of coloration.

Amphidromus versicolor aborlanensis, new subspecies. Plate 6, fig. 1.

Shell sinistral, ovate, with a faint dark apical spot succeeded by a little more than two whorls of chocolate brown, followed by turns marked with broad somewhat irregular, at times posteriorly bifurcated almost vertical zones which are brown on the first two turns thus marked and beyond this gradually shade into olive green. These zones and the narrower yellow interspaces separating them terminate anteriorly at the peripheral spiral band which is of a darker shade of green. Anterior to the periphery a bright yellow spiral zone of double the width of the peripheral band is present and this is bounded anteriorly by a spiral band of green equalling the peripheral zone in width and color. Adjoining this zone is a narrow line of yellow followed by a dull dark red columellar area. Peristome of the outer lip white, columellar dusky; interior of aperture dark brown showing the yellow band.

Twelve specimens before me were collected by Sr. Pedro de Mesa at Mt. Aborlan, Palawan. The type is Cat. No. 543218; the paratypes are registered as 543219.

These specimens measure:

	No. of Whorls	Length in mm.	Diameter in mm.	
1	6.2	34.3	18.5	(type)
2	6.2	31.	17.	
3	6.1	29.1	17.	
4	6.	29.	17.2	
5	6.4	31.3	16.	

	No. of Whorls	Length in mm.	Diameter in mm.
6	6.4	32.2	17.
7	tip broken		16.
8	tip broken		19.
9	tip broken		16.5
Greatest	6.4	34.3	19.
Average	6.2	31.1	17.1
Least	6.	29.	16.

This subspecies resembles *Amphidromus versicolor demesai* but can at once be distinguished from it by the absence of the subsutural red band, duller columellar red area and paler nuclear tip as well as in shades of coloration.

AMPHIDROMUS VERSICOLOR NEGROSENSIS, new subspecies. Plate 6, fig. 2.

Shell elongate-ovate, sinistral. Nucleus with a dark tip; the succeeding turns martius yellow, gradually changing to buff yellow on the last whorl. The periphery shows a faint narrow pale zone and the base is a little darker than the anterior portion of the last whorl, and in one specimen ten short spiral streaks are present on the basal portion immediately behind the peristome. Peristome and interior of aperture white. The whorls are slightly rounded, separated by a moderately impressed suture and marked by oblique incremental lines. Periphery with a mere indication of an angulation.

The ten specimens received from Mr. Pedro de Mesa who states that he collected them at Bacalod, Negros, Philippine Islands, in 1939, yield the following measurements:

	No. of Whorls	Length in mm.	Diameter in mm.	
1	7.1	37.0	17.6	
2	7.0	40.3	20.3	
3	6.6	37.8	19.2	
4	(tip broken)		17.4	
5	7.2	39.7	19.0	(type)
6	7.3	45.1	20.8	
7	7.1	38.0	18.8	
8	7.1	39.7	20.1	
9	7.3	43.2	20.5	
10	7.5	45.0	20.9	
Greatest	7.5	45.1	20.9	
Average	7.1	40.6	19.46	
Least	6.6	37.0	17.4	

No. 5 of these is the type. It is registered as U.S.N.M. No. 542921. The rest of the specimens bear the U.S.N.M. No. 542922.

This subspecies is the first member of the *versicolor* group reported from the central group of islands. It resembles the plain colored members of typical *versicolor* both in shape and in the dark tip, differing, however, by the uniform coloration of the population instead of the enormous variability displayed by *versicolor* proper, also the narrow pale peripheral zone seems to be more pronounced here than in typical *versicolor*.

THE AMERICAN MALACOLOGICAL UNION— TWELFTH ANNUAL MEETING

By Imogene C. Robertson

The suspension of annual meetings of the American Malacological Union, enforced during the war years, was happily terminated this summer when the twelfth annual meeting was held in Washington, D. C., August 14 to 16, in the United States National Museum.

Dr. Alexander Wetmore, Secretary of the Smithsonian Institution, welcomed the delegates at the opening of the program on Wednesday afternoon. Dr. Henry van der Schalie of the Museum of Zoology of the University of Michigan, President of the Union, responded appreciatively. The following papers were read at the afternoon session: "The Unionidae of New England," Richard I. Johnson. "Surveys for Schistosomiasis on Mindanao," Dr. W. R. Wright. "A Study of Native Planorbidae as Possible Intermediate Hosts of *Schistosoma mansoni* in Man," Dr. Eloise B. Cram. "Notes on Mollusks Attached to the American Lobster," Ralph W. Dexter. "A Biographical Sketch of Jacob Green," Gordon K. MacMillan. "Limaces of North America," Dr. Henry A. Pilsbry.

The annual dinner was held in Annapolis Hotel at 8 o'clock, forty-nine members and guests attending. Dr. Paul Bartsch was honored on this occasion, the date being the seventy-fifth anniversary of his birth. The speakers were introduced by Dr. van der Schalie, all paying tribute to Dr. Bartsch in his manifold roles as researcher, educator, and friend. Dr. Waldo

Schmidt, a former student of Dr. Bartsch's and now his successor as head curator of the Museum, was the first to be called on, his remarks being a tribute to the friendship developed during the years of their association. He was followed by Dr. Pilsbry who recalled that Dr. Bartsch's first interest was ornithology and that it was Dr. Dall who was influential in causing him to become a specialist in malacology. William J. Clench spoke of him as a standard of attainment in the science to be aimed at for those coming after, and of his never-failing readiness to help the aspiring student. Dr. Fritz Haas, who had been trained in European museums, told of the esteem in which Dr. Bartsch is held there. Dr. Jeanne Schwengel voiced appreciation of the unsurpassed work done by him and of his personal kindness. Mrs. Harold Robertson gave the final word of tribute to a generous friend and pillar of the American Malacological Union. She then, on behalf of the Union, presented to Dr. Bartsch the birthday gift of a beautiful electric clock with a handsomely engrossed birthday card signed by all present.

Dr. Bartsch responded feelingly with a resumé of his scientific activities during a long life of service in the field of malacology.

The scientific program was resumed Thursday morning at 10 o'clock when the following papers were presented: "Members of the Genus *Tropicorbis* Found in Louisiana and Texas," Dr. Elmer G. Berry. "Procedure in the Collecting and Study of Boring and Fouling Mollusks," Ruth D. Turner. "Shell Sculpture in normally Smooth Unionid Shells," Dr. Fritz Haas. "Hunting Fossils in the Florida Miocene," John Dyas Parker.

The afternoon program was opened with a brief business session during which recommendations made by the Council were acted upon. The place of meeting in 1947 was discussed and it was decided to leave the decision to a vote by mail by the membership. Two localities are under consideration: Pacific Grove, California, and Sanibel, Florida. Officers elected are: President, Dr. Henry van der Schalie; vice-president, Dr. Myra Keen; secretary, Mrs. Harold R. Robertson; treasurer, Harold R. Robertson; councillors: Dr. B. R. Bales, Dr. Joseph C. Bequaert, John Q. Burch, Dr. John Oughton. Past presidents remaining on the Council without reelection: Dr. Joshua L. Baily, Jr., Dr. Horace Burrington Baker, Dr. Paul Bartsch,

William J. Clench, Calvin Goodrich, Dr. Louise M. Perry, Dr. Henry A. Pilsbry, Dr. Harald A. Rehder, Maxwell Smith, and Dr. Carlos de la Torre.

Papers in the afternoon session were: "Problems Relating to Molluscan Faunal Zones in Late Tertiary and Pleistocene Deposits of Kansas," A. B. Leonard. "Looking Ahead in Malacology," William J. Clench. "Searching for Mollusks and Crustacea along the West Coast of Mexico," A. Sorensen. "The Types of Philip P. Carpenter," Katherine V. W. Palmer. William J. Bower spoke briefly on "Health Building Values of Shell Work" and Mrs. Fred S. Hoffman on "Shell Collecting by Our Boys in the Service" at the conclusion of the program. A short film taken at the Rockland meeting in 1941 was shown at the beginning of the afternoon meeting.

At six o'clock members were guests of Dr. Jeanne S. Schwengel at a cocktail party and buffet supper in the Washington Hotel. This much appreciated entertainment was followed by an impromptu visit to the Aquarium as guests of the Director, Fred S. Orsinger. All who attended this personally conducted tour were treated to behind-the-scenes views of the water creatures and learned many unusual facts concerning them.

Thursday was given over to an outing and buffet luncheon at Lebanon, Dr. Bartsch's 450-acre estate on the Potomac River. A light rain prevented the anticipated collecting experiences, but provided time for a visit to nearby Gunston Hall, the colonial home built by George Mason, author of the Bill of Rights, and now the home of Louis Hertle who restored it and presented it to the State of Virginia, retaining a life use of it. While it was with deep regret that Dr. Bartsch's original schedule could not be carried out, this opportunity of a glimpse into the gracious living of past generations was much enjoyed as was the visit to Pohick Church which was made as a stop on the outward trip to Dr. Bartsch's farm.

A buffet luncheon which featured a variety of delectable salads was provided by our hostess, Dr. Elizabeth Parker Bartsch, and there were luscious watermelons thoughtfully furnished by Dr. Julia Gardner and partaken of just before the final leave taking in the late afternoon. The pleasant reunions

and the seeing of new faces was stimulating to everyone, and the time together seemed all too short.

REPUBLICATION OF DESCRIPTIONS OF NORTH AMERICAN MOLLUSKS BY VERKRÜZEN, KURTZ AND DE TAR AND BEECHER

By WILLIAM J. CLENCH

The following descriptions are republished only because the original publications are excessively rare and but few copies of each are known to exist.

A few of the described forms have been listed, mainly in synonymies of well known species; others have been overlooked or certainly not considered worthy of note. As these several entities have been validly introduced in the literature, they are names which must be taken into consideration when any attempt is made to study a species or group of species in which they play a part, even if that part is only a portion of the historical background.

All bracketed entries are my own or original page references.

Mollusca / Dredged and Collected / by T. A. Verkrüzen, / in 1876, / in the Neighbourhood of St. John's, / Newfoundland, / Including a few Species Obtained from the Bay of Fundy. / St. John's, N. F. 1877, pp. 1–11.

[This small octavo pamphlet consists of a list of marine shells with notes on their local occurrence at St. John's, Newfoundland and a few additional records from Bay of Fundy, Nova Scotia. There are no plates. Descriptions of six new varieties are given.

It is quite certain that neither C. W. Johnson (Marine Mollusca of the Atlantic Coast from Labrador to Texas, 1934) nor J. F. Whiteaves (Catalogue of he Marine Invertebrata of Eastern Canada, 1901) ever saw this publication. Whiteaves (p. 5) lists this publication but no records are given in his comprehensive report nor are any of the new forms by Verkrüzen listed as valid or included in his synonymies. The following are exact copies of Verkrüzen's descriptions.]

[p. 4] 20. *Cardium (Aphrodite) grönlandicum, var. album V.* —1 specimen from the Bank. The valves of this handsome variety are of a pale drab and semitransparent, whilst those of the type are variously and prettily marked.

[p. 4] 21. *Cardita borealis Conr. var. St. Johnensis, Verkr.*— Harbour and Narrows, not common. This variety is distinct from the typical form by a broader and more equilateral shape; [p. 5] it is not inflected at the lunule below the umbones, and which the latter do not project, as it is more or less the case with the typus; it is finely much smaller, the largest adult valves being scarcely half the size of a typical Cardita borealis from neighbouring Southern seas. I am inclined to consider it a good species and would retain the name: Cardita St. Johnensis Verkr.

[p. 6] 38. *Chiton marmoreus, var. pusulosus Verkr.*—Narrows; scarce. This variety does not show the retangular ribs on the shields, which are peculiar to the type, or sometimes very faintly only, but is covered over with minute pustules, not visible to the naked eye.

[p. 6] 39. *Chiton marmoreus, var. St. Johnensis, Verkr.*— This elegant variety is of a brilliant green colour, especially when alive, and in sculpture inclines rather to the preceding variety more than to the type, I obtained but few specimens.

[p. 8] 78. *Trichotropic borealis, Sow. var. St. Johnensis Verkr.* —Harbour and Narrows. This fine variety is distinguished from the European type by a larger [p. 9] size and stronger texture, *strong* bright yellow brown Epidermis, a more projecting outer lip, and is frequently coloured within of a lively brownish yellow. It may be called the handsomest shell of St. John's Harbour.

[p. 11] 46. *Molleria costulata, Moll. var. glabra, Verkr.*— Harbour, scarce. Instead of the strong ribs of growth of the type, this var. is quite smooth; intermediates have faint ribs.

[The following paper on *Planorbis costatus* by De Tar and Beecher appeared as a single small octavo page, printed on one side only. Dall lists this species as a synonym of *Armiger crista* Linné (Dall 1905, Alaska, Land and Freshwater Shells, Harriman Alaska Expedition 8, p. 96).]

Planorbis Costatus De Tar and Beecher

Subgenus Menetus

Shell dextral, minute, yellowish horn color. Diameter 9/10 Mill. Volutions 3–3½, rapidly increasing, outer slightly carinate above; upper surface of volutions flattened, or very slightly convex; lower surface convex. Peristome acute, not thickened.

Umbilicus profound, showing all of the volutions. Aperture semiorbicular, very oblique. Surface delicately reticulate, ornamented with prominent transverse ribs.

Habitat, Huron River, Ann Arbor, Michigan. Found in rather deep water on weeds and fragments of wood. Date 1874.

This species is readily distinguished from any allied form by the possession of very marked transverse costae or ribs.

Albany [New York] Oct. 25th, 1878.

Catalogue / of / Recent Marine Shells, / Found on the Coasts of / North and South Carolina. / By J. D. Kurtz / Portland: / 1860.

[This is a nine page octavo report which was published in Portland, Maine by David Tucker. It comprises a list of the marine species collected by Kurtz during the years 1848 to 1852. Several new species are described with exceedingly short descriptions and no figures. Specific localities are generally given for the rare forms and a general locality as "N. and S. C." for the common species. A few nude names are listed which are not included here. Exact transcriptions of Kurtz are given below.]

[p. 4] LEPTON LONGIPES Kurtz. n.s. Fort Johnson, S. C. Differs from L. FABAGELLA, Conrad, as figured by DeKay (N. Y. Reports) in being a larger shell and comparatively wider.

[p. 4] CYTHEREA ? Width 1.5 in., height 1.1 in. This beautiful species [p. 5] merits the name BELLA unless otherwise designated by Prof. Holmes, who dredged it "of Charleston bar." [Under the rules this species would hardly be described. It is included as a matter of record only.]

[p. 5] VENUS TRAPEZOIDALIS, Kurtz. n.s., width .5 in., covered with convex radiating ribs, set with brown spots and scales of growth. A thin brown pile on good specimens. N. and S. C.

[p. 5] ARCA HOLMESII Kurtz. n.s. Distinguished from its analogues, A. PEXATA AND A. AMERICANA, by Prof. Holmes. It is smaller, more inflated, solid, and globular. Inhabits the estuaries. N. and S. C.

[p. 7] SCALARIA RUPICULA Kurtz. n.s., length, 5 in., divergence 48°, whorls brown, ribs white; in the crevices of stones. Ft. Johnson, S. C.

[p. 8] CHEMNITZIA TEXTILIS, Kurtz. n.s., length, .13, width .05 in., white, waxy or chalky, six or seven shouldered whorls, thick set with prominent smooth longitudinal ribs, the interspaces crossed by impressed revolving lines. Fort Johnson, S. C.

NOTES AND NEWS

A ROUNDUP OF COCHLICOPA LUBRICA.—"At my place there used to be a small summer-house with a cement floor, 8 feet in diameter. The roof and walls had been cleared away, only the floor left, with three steps up to it. Now, the other day, inside of twelve hours, evening till morning, thousands of earthworms appeared on the cement floor, and hundreds of small shells [*Cochlicopa lubrica*]. How did they get there? I am sending a sample of the shells. Have you any explanation?" (Extract from a letter dated June 4, from Mr. N. H. Caesar, Sundial Ranch, Okanagan Centre, near Vernon, B. C., to Dr. Hugh B. Leech, Department of Agriculture, Vernon, B. C., and transmitted to us by Professor T. D. A. Cockerell.) Possibly these assemblages are for the purpose of breeding.

SINISTRAL LIGUUS FASCIATUS IN FLORIDA.—Probably 100,000 or more *Liguus* have been collected in Florida, but sinistral specimens are still among the greatest rarities. In Miami last April, Mr. R. F. Deckert showed me beautiful water-color drawings of five of them, and gave me records of all which he knew to exist. The list follows, only the subspecific and varietal names being given in the first column.

	Locality and Date	Collector	Collection
Castaneozanatus	Key Largo, July, 1940	Mr. Cabot	Cabot
Castaneozonatus	P.C. 32, Oct. 1940	J. Pflueger	Pflueger
C. var. *miamiensis*	Brickell H., 1937	?	Grimshawe
C. var. *lineolatus*	Key Largo, . . ?	Buckshorn	Buckshorn
C. var. *roseatus*	Key Largo, 1939	Mr. Emery	Emery
Testudineus var. *versicolor*	Osteen H., L.P.K. Mar. 1931	Plass Owen	Owen
Testudineus var. *versicolor*	L.P.K. 26, 1940	Newt Lewis	Lewis
Testudineus var. *castaneus*	L.P.K. 26, . . ?	H. Rohde	
Testudineus var. *ornatus*	L.P.K. 26, Dec. 27, 1941	George Spurling	Spurling

(P.C. = Pinecrest; L.P.K. = Long Pine Key.)

There is a var. *roseatus* in the Maxwell Smith collection, which we have figured in "Land Mollusca of North America," vol. 2, p. 38, fig. 20. Possibly some others in collections have escaped Mr. Deckert's notice; if so we will be glad to have the records.—H. A. P.

DR. BLENN R. BALES

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LITTORINA LITTOREA ON THE NEW JERSEY COAST

By ROBERT C. ALEXANDER

The periwinkle *Littorina littorea* (Linné) is one of a few species of mollusks living on both the eastern and western shores of the north Atlantic Ocean.

Littorina littorea has not been found as a fossil in North America nor have the shells of this species been found in the shell-heaps of the American Indians. In fact, there is no record of this mollusk inhabiting our shores until 1840 when J. W. Dawson is said to have seen it at Pictou, Nova Scotia.

Consequently, conchologists are of the opinion that this species is not indigenous to this continent but is, instead, a fairly recent immigrant, probably having been introduced accidentally or intentionally from across the ocean by man. Where the species first became established over here is not known, but is believed to have been somewhere on the coast of Nova Scotia, where it was first observed.

Finding conditions here favorable to its existence and being carried from place to place in its early pelagic stages by ocean currents, the periwinkle has advanced southward along the east coast with remarkable success becoming one of the most abundant, if not the most abundant, mollusks in many of the localities it has invaded. From time to time, reports of its occurrence at various localities along the coast have been published and these reports assembled in chronological order present a unique history of the steadily increasing range of this mollusk.

Littorina littorea was not observed on the coast of New England for more than three decades after Dawson found it at Pictou. It was not listed among the mollusks of Massachusetts by Augustus A. Gould in 1841, the mollusks of Maine by J. W.

Mighels in 1843, the mollusks of Connecticut by J. H. Linsley in 1845, nor was it listed in William Stimpson's "Shells of New England" in 1851. W. G. Binney included it in the revised edition of Gould's "Invertebrata of Massachusetts," 1870, but the only locality given was Halifax. George W. Tryon, Jr., said in his "American Marine Conchology," 1873–74, that this species inhabited the coast of New England, but no specific locality was given.

In 1871, according to Alfred G. Mayer in "Sea-Shore Life," it was found on the coast of New Hampshire, arriving at Salem, Massachusetts, in 1872, and Woods Hole, Massachusetts, in 1875. W. F. Ganong reported its occurrence in Connecticut in 1879.

As far as I know, the earliest record of *Littorina littorea* on the coast of New Jersey are some specimens collected by U. C. Smith at Atlantic City in May, 1891 (ANSP. 61697). The following year, John Ford wrote about these mollusks: "Until recently they were quite rare south of Raritan Bay, but at present a fine colony may be seen on the flats a little west of the Inlet House at Atlantic City" (Nautilus, 1892, vol. 6, no. 3, p. 27).

There were no reports of any further progress for over a quarter of a century. Then, Horace Richards wrote: "I collected several living individuals from the Rock Pile at Cape May, New Jersey, on May 20, 1928" (Nautilus, 1929, vol. 43, no. 2, p. 65).

The Rock Pile is the local name given to the long jetties built of rocks at the ocean end of the channel into Cape May Harbor. It is about six miles up the coast from Cape May Point where the Delaware Bay and Atlantic Ocean meet.

Although rock jetties and breakwaters have been erected at Cape May Point in an effort to prevent erosion of the shoreline, I have not heard of periwinkles being found there nor have I ever found them there myself.

In 1942, I found an area of stone, cement and concrete rubble on a flat of old meadow sod on the beach halfway between the Rock Pile and the end of the Cape May boardwalk. At every high tide, the ocean covered it; at every low tide, the flat was exposed and tide pools containing an interesting variety of marine life remained among the debris. In these tide pools,

the isopod *Idotea balthica* glided like a miniature green submarine among sea lettuce, *Ulva*. Here, the sand shrimp *Crago septemspinosus*, a creature of salt water and sand, lived almost side by side with the common prawn *Palaemonetes vulgaris*, normally an inhabitant of brackish water and mud. Small hermit crabs (*Pagurus longicarpus*) ran about carrying their borrowed shells with them and fought each other for possession of larger shells. Occasionally, a stranded rock crab, *Cancer irroratus*, could be found half-dead among the rubble.

On July 12, 1942, I discovered a colony of young *Littorina littorea* on rocks and blocks of concrete here and collected six living specimens. I returned and collected eight more on July 25, and six others in September of that year.

This thriving colony, half a mile or more below the Rock Pile, may have been at that time the southernmost colony of *Littorina littorea* on the east coast.

Last summer, I visited this place again. The ocean had scattered the rubble far and wide and, although tide pools were still left on the flat at low tide, nothing living was to be found but seaweed and hermit crabs and, of all things for an ocean front situation, a few clusters of ribbed mussels *Modiolus demissus* with their beaks buried in the meadow sod. Not a single *Littorina littorea* remained. The colony had disappeared.

During the last five months of 1942, a tidewater canal was dredged between Cape May Harbor and Delaware Bay making another link in the intracoastal waterway. Rock jetties were built to protect the channel at the bay end of the canal two miles above Cape May Point. They were in a favorable location for marine life and soon the intertidal rocks and the rocks below water level were crowded with seaweed, barnacles, and mollusks. Most numerous of the mollusks inhabiting the rocks were *Mytilus edulis*, including the brown and striped color forms, and young *Ostrea virginica*. Other mollusks were *Crepidula fornicata*, *Crepidula glauca*, *Crepidula plana*, *Urosalpinx cinereus*, *Anachis avara*, and *Mitrella lunata*. *Modiolus demissus* grew along the banks of the canal.

On July 17, 1946, my first visit to these jetties, I found a single young *Littorina littorea* clinging to a rock on the south jetty not far below the high water mark. The shell measured

17.3 mm. high, and 16.2 mm. in diameter, with an aperture 13.6 × 12 mm. (ANSP 182241). On September 22, I found another living periwinkle there. It was about the same size as the first one. At last, *Littorina littorea* had reached Delaware Bay.

It has taken longer to come from Atlantic City to Delaware Bay than it took to come all the way from Nova Scotia to Atlantic City, so it may be assumed the species is nearly as far south along the east coast as it can go.

Primarily a rock-inhabiting mollusk, *Littorina littorea* is still far from common in New Jersey where sandy beaches extend along the entire seacoast.

Additional records for New Jersey including the date of collection where available are: Point Pleasant, before November 27, 1894 (Stewardson Brown). Longport, in tidal pool along sea wall of Weidner Home, 1919 (L. H. Bregy). High Point, 4 miles south of Barnegat Light, November 25, 1922 (William O. Abbott). Ocean City, 1945 (C. J. Lode). Neptune City, Monmouth County (Johnsonia, no. 7, p. 5).

A NEW PYRGULOPSIS FROM OREGON

By S. STILLMAN BERRY, Redlands, California

In the course of reviewing for other purposes some of the many interesting Mollusca of the Klamath River drainage basin, I find myself unable to make a satisfactory disposition of the little-known *Pyrgulopsis* from Upper Klamath Lake (see Henderson, 1928, 1929) except by describing it as new.

Pyrgulopsis archimedis, new species (Pl. 7, fig. 6).

Shell minute, almost perfectly conical in main outline, the periphery sharply angulate and abruptly pinched out into a prominent and extremely heavy rounded keel, which descends the spire a trifle above the narrow and rather dim suture. Apex subacute, the whorls 6 or a little less; side-slopes convex on early whorls, falling away almost vertically or sometimes even sloping inwardly below the keel on the latter turns, then

more straightly outward into the keel again. Aperture large, triangular-pyriform, or possibly better described as stirrup-shaped, subangulate posteriorly, its outer margin pinched out in continuity with the strong interior groove which hollows the keel; base rounded but not greatly produced. Surface sculpture absent except that strong illumination brings out traces of fine spiral lines.

Alt. 4.24, max. diam. 2.89, diam. aperture excluding keel 1.46 mm.

Holotype: Cat. no. 8068 Berry collection. Paratypes: Cat. no. 7932 Berry collection; others to be deposited in the collections of the California Academy of Sciences, the U. S. National Museum, the San Diego Museum of Natural History, and the private collection of Allyn G. Smith of Berkeley.

Type locality: Upper Klamath Lake, near Algoma, Oregon; Allyn G. Smith, 16 June, 1931.

This is an extraordinarily curious and attractive little species, clearly allied with its neighbor, *P. nevadensis* (Stearns, 1883),[1] but differing in the much more powerfully developed keel, concave whorls, and particularly the large acutely angled aperture and less produced base. Furthermore, the spiral sculpture seems appreciably stronger on shells of *P. nevadensis,* but this may in part be due to their bleached condition.

Shells from Winnemucca Lake, Nevada, appear sufficiently different from those of the typical Pyramid Lake race to deserve a name of their own, but I withhold a separate denomination of them until I can secure a more widely representative series of both fossil and living shells of this genus than I at present possess.

Quite recently, Cockerell (1946: 235) has attributed *P. nevadensis* to the Cahuilla alluvium of the Colorado desert in southern California on the basis of a single shell discovered there by Dr. W. O. Gregg. The report is somewhat premature however, since the specimen in question represents not this species but an altogether distinct and apparently undescribed form, which now awaits only the recovery of a little more material to be made the subject of a further appropriate communication either from Dr. Gregg or myself.

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[1] Cf. my no. 2874, west shore of Pyramid Lake, Nevada; J. H. Paine, June, 1911.

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Stearns, R. E. C., 1883. Description of a new hydrobiinoid gasteropod from the mountain lakes of the Sierra Nevada, with remarks on allied species and the physiographical features of said region. Proc. Acad. Nat. Sci. Philadelphia, 35 (2): 171–176, 1 text-fig., Sept., 1883.

SOME MOLLUSCA OF ILLION GORGE, HERKIMER COUNTY, NEW YORK

BY C. L. BLAKESLEE

The January, 1943, issue of Nautilus contained an article written by William Henry Fluck relating a collecting experience he enjoyed, in days gone by, in the Illion Gorge, one of two gorges that emerge out of the high hills south of the town of Illion, N. Y., and terminate at that place. In this gorge Mr. Fluck collected several hundred snails, mostly *Mesodon zaletus* Binney, in one day's time. After reading Mr. Fluck's contribution, I immediately began to plan a trip to the gorge notwithstanding that the round distance was over three hundred miles. However, the war was on and the gas was not to be had so I impatiently settled down in the hope that I would not have to wait very long before the enemies would be subdued and the trip could be undertaken. The desire never flagged throughout the many months. The war ended too late in 1945 for the undertaking and so it was carried over into the spring of this year.

[2] Cf. Nautilus 43: 103 and 53: 137.—H. B. B.

In the meantime, I had written to Mr. Fluck for more specific directions for finding the site in the gorge. He replied that it was a rather insignificant lateral ravine coming down into the main gorge and occupied by a small stream. It was to be found "just beyond the houses" which referred to a cluster of dwellings along the gorge road after leaving the town and that it might be recognized by its association with a calcareous tufa-like formation. In the Nautilus, Mr. Fluck says: "It is filled with snails, especially *Mesodon exoleta,*" and later he wrote: "Be sure and examine the crevices in the rocks."

Turning to Dr. Pilsbry's "Mollusca of North America," I found an expected reference to the region (Mohawk) and that the ancestors of the *M. zaletus* found there were introduced from Ohio by Dr. James Lewis in 1874. The record states that they were released at Mohawk but, as that town is only two or three miles from the Illion end of the gorge, descendants of the Lewis introduction may have migrated over the intervening distance in the seventy years interim.

Plans were made to make the trip to the gorge the early part of June, the time recommended by Mr. Fluck, but one thing and another acted as a deterrent until July 8th. The start was then made and the gorge was entered from the south end at the town of Winfield. Its entire length of thirteen miles was run for the purpose of noting sites such as described by Mr. Fluck. Reaching Illion, the route was retraced until a lateral ravine, occupied by a small stream and located beyond a group of houses, appeared to meet the description that had been given.

Getting over to the mouth of it, the search was begun. Rain apparently had fallen during the night, for the ground was wet and the thick vegetation carried a fair amount of moisture. Some unrecognized plants with large leaves were abundant and I soon found that the undersides were concealing an abundance of feeding snails. An examination showed that they were not *M. zaletus* but that they might be immature *Mesodon thyroidus.* Then finding one with a lip the question arose as to whether they were *Mesodon mitchellianus* or *M. clausus.* Remembering that *M. clausus* was not an inhabitant here, it was decided the species was *M. mitchellianus.* About fifty mature specimens were found in about fifteen minutes and also two dead *M. zaletus.* At least over one hundred immature *M. mitchellianus* were observed.

A couple of weeks later, Morrie K. Jacobson, whom I had previously invited, stopped over on a trip he was making to the west, to become acquainted and to do some shell collecting. After he had rested a day, Mrs. Blakeslee, Mr. Jacobson and myself set out to again visit the gorge. In due time, we found ourselves at the site previously visited. With great expectations, we hurried from the car over to the collecting site but not a single live *M. mitchellianus* or *M. zaletus* could be found. The daylight, temperature and time of day were nearly identical with the conditions prevailing at the time of the first visit and the ground was damp with some moisture on the vegetation.

Mr. Jacobson decided to scale the steep and slippery water worn bed of the ravine stream and see if altitude would affect the possibilities. Mrs. Blakeslee resolved to wander a distance up the road to a bridge spanning a stream that had been accompanying the gorge road for some distance and at that point had decided to explore the opposite side.

Standing at the foot of the water worn lateral ravine watching Mr. Jacobson negotiate his difficult ascent, I was startled out of a subconscious reflection on the vagaries of mollusks by an agonized call from Mrs. Blakeslee. Getting over to where she was much too slowly for her agitated state, I found that she attained her destination at the brdge she had nearly stepped into a party of several snakes sunning themselves or else out for other purposes of their own. Being "allergic" to such reptiles, apparently she thought calling would be more effective than running.

I could not forego the dormant juvenile urge to stir them up with the end of a weed stalk and, while one or two of them took the ten foot plunge to the stream below and others disappeared under abutment stones, two made off into the grass bordering the pavement of the road. In trying to keep them in sight, one of us (Mr. Jacobson had joined us) saw a *M. mitchellianus* in the grass through which the snakes were escaping. Then others, and instantly we two men were down on our knees picking mature shells from out the growth. We soon had what we considered enough and with lighter hearts, purged of disappointment, we headed out into the west for the long ride home.

The paucity of *Mesodon zaletus* and the abundance of *M. mitchellianus* may indicate that the site selected was not the one

visited by Mr. Fluck. If this is a fact, which will be verified next year, it gives a promise of a richness of mollusean life in the gorge that would well repay any conchologist who can visit it during any of the summer months.

COLOR VARIATION IN OLIVELLA UNDATELLA

By D. S. and E. W. GIFFORD

Four days of collecting on the sandy palm-fringed shore of lovely Santiago Bay near the city of Manzanillo, Colima, Mexico, yielded three species of olive shells: *Agaronia hiatula* Gmelin, *Olivella zonalis* Lamarck, and *Olivella undatella* Lamarck. The days were January 30 and 31 and February 1 and 2, 1946. The tides were in the afternoon. We had the aid of our friends, Mr. and Mrs. George M. Foster, in garnering a series of 2,641 *Olivella undatella*. This was our first acquaintanee with this beautiful and highly variable species, except for archaeological specimens in the form of beads from an ancient aboriginal site near Indio, Riverside County, California. These ancient examples must have been traded to the Southern Californians from a source much closer than the state of Colima—probably the shores of the Gulf of California.

In its range from pure white to very dark shells, *Olivella undatella* is reminiscent of *Olivella biplicata*.[1] Tryon has called attention to this great range in coloration in *Olivella undatella*. After describing the predominant coloration of the species, he remarks:[2] "The above description is that of the typical coloration, but the variation in color and markings is so great that it is wonderful that a number of species have not been separated from it. One of the principal variations is a pure white, with indefinite cloudings, maculations or zigzags of chocolate; another white, with pink longitudinal zigzag markings, etc." Tryon's comment about separation of "a number of species" does not refer to the process of evolution, but to the penchant of some malacologists to attach new names to color variants.

[1] D. S. and E. W. Gifford, The Nautilus, vol. 56, pp. 43–48, 1942.

[2] George W. Tryon, Jr., Manual of Conchology, vol. 5, p. 70, 1883.

We elected to rigorously segregate albinos with even a speck of color from the pure albinos, which are absolutely immaculate. It is of interest to note that the immaculate albino group amounts to 20 per cent of the population. Incidentally, we should state that on the beach we collected indiscriminately, exercising no selection as to color whatsoever. Consequently, our series of 2,641 should represent the range and percentages of colors with fair accuracy. The percentage of immaculate albinos is high in comparison to the 12 per cent occurrence of albinism in *Olivella biplicata*[3] from Santa Cruz and Monterey, California. Moreover, included as albinos in the California series are white shells with orange color within the aperture.

The white of the albino *Olivella undatella* is of two qualities or appearances. That of the body whorl is translucent like thin porcelain, while that of the fasciole and columella base is opaque, due to the thicker enamel.

Once the 524 pure albinos are set to one side, no two colored shells are identical. In other words we have 2,117 shells with individually distinctive markings. We have grouped these into eleven categories, ranging more or less from light to dark. The presence of longitudinal zigzag vermiculations and stripes on most of the colored shells increases the amount of individual variations, which is not just a matter of solid colors but of pattern of markings as well.

Group 1: Albinos, immaculate 524
Group 2: Albinos, except for one to several faint brown spots on body whorl near suture and (or) near fasciole 32
Group 3: Albinos, except for more or less yellow on fasciole and one to several brown spots on body whorl near suture and (or) near fasciole, plus more or less yellow on the fasciole with longitudinal chestnut stripes; white at base of columella and within lip of body whorl 12
Group 4: Albinos, except for varying dark brown and gray markings (sometimes obsolete or veiled) on body whorl near suture and near fasciole; some chocolate areas within lip of body whorl; fasciole white except some with brown stripes; more or less piebald appearance 81
Group 5: Flesh-colored with fawn-colored zigzag longitudinal vermiculations; whitish band beneath sutures with more or

[3] Gifford, op. cit., p. 45.

less obsolescent fawn markings; fasciole usually plain whitish or ivory, rarely yellow 24

Group 6: Longitudinal zigzag vermiculations of reddish brown veiled with pearl gray to plumbeous; band beneath sutures whitish with brown marks; fasciole white without stripes; varying amounts of chocolate brown at base of columella and within lip of body whorl 85

Group 7: Xanthochroistic,[4] without vermiculations or stripes; body whorl tending toward whitish in central portion 1

Group 8: Xanthochroistic with longitudinal vermiculations; yellowest one matches Maerz and Paul, pl. 12, 8L, antique gold or golden Y; within lip all have more or less golden brown; band beneath sutures, and fasciole, with chestnut longitudinal stripes 7

Group 9: Yellowish brown, vermiculate, sometimes overlying olive green, suggesting somewhat the combination of colors in *Oliva tricolor;* bishop purple and other purples inside lip of body whorl; band beneath sutures, and fasciole, yellow with chestnut longitudinal stripes. Cf. Tryon, pl. 17, fig. 38; pl. 33, fig. 31 158

Group 10: White or whitish ground color with conspicuous reddish brown to gray longitudinal vermiculations; band beneath sutures, and fasciole, yellowish with chestnut longitudinal stripes; more or less dull purple inside lip of body whorl. Cf. Tryon, pl. 17, fig. 35 147

Group 11: "Ash-gray, with zigzag chestnut markings [vermiculations], distinct or obsolete, but forming two well-marked revolving bands by the color becoming more emphasized; a yellow band marked with chestnut beneath the sutures; fasciole yellowish, strigated with chestnut; interior and base of columella chocolate-colored." Tryon, p. 70. Cf. his figure: pl. 16, fig. 18 1253

Group 12: Dark ground color, usually solid on body whorl, but sometimes broken by tendency to two bands of vermiculation; color range shown on Maerz and Paul, pl. 48. Some colors represented in our series are designated as "egg plant, Spanish raisin, pewter, admiral," etc., but all seem to be on this single plate. Band beneath suture, and fasciole, yellowish to brownish yellow with longitudinal chestnut stripes; base of columella and inside lip of body whorl usually body-whorl color. Cf. Tryon, pl. 17, figs. 36, 37 317

As should be reiterated, our color groupings are on the basis of impressions as to general resemblances, since no two speci-

[4] A. Maerz and M. R. Paul, A Dictionary of Color, pl. 19, 4I, 1930.

mens are identical. The majority of colored shells have a yellowish fasciole with chestnut stripes. Exceptions are the pure albinos (group 1) and groups 2, 4, 5, and 6. Even the very dark shells have the yellowish fasciole, which is evidently one of the striking characteristics of the species, but not a universal one. Tryon calls attention to it in his description of the typical coloration, which we have quoted.

Variation in shape of the shells is not obtrusive. Scanning our series for obese and slender examples, we have selected two extremes. These yield length-breadth indices of 51 for the obese shell and 47 for the slender shell.

ONE HUNDRED SIX YEARS OF AMNICOLA

By J. P. E. MORRISON[1]

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Since 1927, shortly before the publication of the late F. C. Baker's "Monograph of Wisconsin Freshwater Mollusca," the writer has been interested in the critical determination of the species of small gastropods usually referred to the genus *Amnicola*. This abbreviated history of the genus is written to correct mistakes of 100 years' standing in regard to the genotype, and the consequent erroneous usage of the generic name.

July, 1840, is the earliest valid date of publication of *Amnicola*. On page 3 of part 1 of his Monograph, Haldeman restricted *Paludina* to exclude his new genus *Amnicola*, which was monobasic and monotypic, the type by original designation being *Paludina lustrica* Say, 1821. In October, 1840, on page 3 of his "Supplement," Haldeman again described *Amnicola*, but without mention of species.

Amnicola Gray, 1840 (Syn. Contents Brit. Mus., edn. 42, p. 147) is a *nomen nudum*, being without description or included species.

Gould (Invert. of Mass., 1841, p. 228) more fully described

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[1] Published by permission of the Secretary of the Smithsonian Institution.

Amnicola, including the genotype, *P. lustrica* Say, and five other species. He did not confuse *P. lustrica* with *A. porata*, the only species described by him from Massachusetts.

Isaac Lea (Obs., vol. 4, p. 16, 1844) stated: "The genus *Amnicola*, proposed by Dr. Gould, and adopted by Mr. Haldeman, in his table of 'Water-breathing Lymniades,' is separated from the genus *Paludina; Paludina lustrica* Say being made the type." This paraphrased restatement by Lea of Haldeman's original designation confirmed *P. lustrica* Say, 1821, as the genotype.

In part 8 of his Monograph (June, 1845), Haldeman cites three different uses of *lustrica*. On page 10 he describes *Amnicola limosa* Say, with "*Amnicola lustrica* Hald. in letters" in its synonymy. This *Amnicola lustrica* Haldeman dates from June, 1845; as a homonym it has no bearing on *Amnicola lustrica* (Say), 1821. On page 12, Haldeman places *Paludina lustrica* C. B. Ads. (Hist. of Vt., app., pp. 2, 19, 1842) in the synonymy of *Amnicola pallida* Hald., Jan., 1842. On page 16, he accords *Amnicola lustrica* (Say), 1821, the rank of a distinct species, citing only the original reference and quoting Say's description verbatim.

In the footnote on page 16, Haldeman mentions the existing Philadelphia Academy specimen received from Say. The measurements of this specimen (5 or 6 mm. long) preclude its being *P. lustrica*, originally described by Say as "less than 1/10th inch" long. This shell was figured by Binney (L. & F. W. Shells of N. Am., 3, fig. 189, 1865) and was considered typical by Tryon (Continuation of Hald. Mon., p. 57, 1870), Pilsbry (Nautilus 4: 53, 1890), and F. C. Baker (F. W. Moll. Wis., 1, p. 162, 1928), with the placing of *Paludina lustrica* in the synonymy of *Pomatiopsis lapidaria*. Since this (misidentified) specimen was not mentioned in publication prior to 1845, it can have no bearing on the status of *Paludina lustrica* Say, 1821, or upon the status of the name *Amnicola*.

Herrmannsen's (1846, p. 38) designation of *Amnicola porata* (Say), 1821, as genotype is doubly invalid; *A. porata* was not included in the original description of *Amnicola*, and *P. lustrica* Say, the only species included, was actually named as type by Haldeman.

Amnicola lustrica Pilsbry, 1890, is a homonym of *Amnicola lustrica* (Say), 1821, and so untenable. The name *Amnicola lacustris* Pilsbry, 1891 (Nautilus, 4, index, p. iii, 1891), is available but not clear in validity; it is hereby declared to be a nomen novum for the species well known as *Amnicola lustrica* Pilsbry 1890.

Euamnicola Crosse & Fischer (Miss. Sci. Mex., Moll., 2: 261, 1891) is an absolute synonym of *Amnicola s.s.* Their inclusion of the alternative or synonymy "(ou *Amnicola sensu stricto*)" in any case automatically fixed the type of *Euamnicola* in 1891 as identical with that of *Amnicola.* Since Haldeman in 1840 had originally designated the type of his monobasic genus *Amnicola,* Pilsbry's designation (Nautilus 57: 69, 1943) of *Amnicola porata* (Say) as type of *Euamnicola* Crosse & Fischer is invalid and superfluous.

In 1904, Jackson & Taylor (Journ. of Conch., 11: 9–11) described the habits and reproduction of *Paludestrina taylori* E. A. Smith (Ann. Mag. Nat. Hist., ser. 7, 7: 192, 1901) from England. The shell and egg capsules figured by them showed *P. taylori* to be very closely related to *Amnicola limosa porata* (Say) which they regarded as typical of the American *Amnicola* species. These authors referred *P. taylori* to the genus *Amnicola* on this basis.

When F. C. Baker, in 1928, separated as subgenera "*Amnicola, s.s.* (type: *A. limosa* Say, 1817)" (F. W. Moll. Wis., 1: 93) and *Marstonia* (type: *A. lustrica* Pilsbry, 1890, non Say, 1821 = *A. lacustris* Pilsbry, 1891) (ibid., p. 103) he made another invalid type designation. The species *A. limosa* was not included in the original generic description; also it cannot be the type by subsequent designation, when *A. lustrica* (Say) is the type by original designation.

Altena in 1936 submitted evidence (Basteria, I, 68: 1936) to prove that *Paludestrina taylori* E. A. Smith from England is synonymous with *Hydrobia steinii* Martens from continental Europe, and proposed the new genus *Marstoniopsis* for *H. steinii.* He showed that the egg capsules and verge of *M. steinii* are of the same type as those known for *porata.* Likewise, the differences noted by Altena between the radula of *steinii* and that of *Marstonia* at once relate *steinii* to the group of *Amnicola*

porata (Say), incorrectly called *Amnicola, s.s.* by F. C. Baker (cf. fig. 44, p. 96, F. W. Moll. Wis., I, 1928).

E. G. Berry has recently monographed the Amnicolidae of Michigan (Misc. Publ., Mus. Zool., U. of Mich., No. 57, 1943) with excellent anatomic detail. The extreme difference between the verge of *A. limosa* and that of *A. lacustris* (*lustrica* Pils.), indicated by Dr. Berry, has been personally corroborated by dissection of animals from other localities. This difference requires the recognition of *Marstonia* F. C. Baker 1926 (Trans. Wis. Acad. Sci., 22: 195, 1926) as a genus, biologically distinct from the group of "*Amnicola, s.s.*" of F. C. Baker; in other words biologically distinct from *Marstoniopsis*.

The generic synonymy to date is thus:

AMNICOLA Haldeman, July, 1840 (non Gould, 1841). Genotype: *Paludina lustrica* Say, 1821.

Euamnicola Crosse & Fischer, 1891. Genotype: *Paludina lustrica* Say, 1821.

? *Marstonia* F. C. Baker, 1926. Genotype: *Amnicola lustrica* Pilsbry, 1890, non (Say) 1821 = *Amnicola lacustris* Pilsbry, 1891.

MARSTONIOPSIS Altena, 1936. Genotype: *Hydrobia steinii* Martens, 1858.

Amnicola Gould, 1841 et auct. (non Haldeman, 1840). Genotype: *Paludina porata* Say, 1821.

This author's present opinion is that *Amnicola, s.s.* will finally prove identical to *Marstonia*. Because of the known shell differences, it probably cannot be the *porata* group, named *Marstoniopsis* by Altena. Whether *Amnicola* Haldeman, 1840, will eventually displace *Marstonia,* or *Marstoniopsis,* or neither, has not yet been determined. *Amnicola lustrica* (Say), 1821, must be rediscovered at the type locality (Cayuga Lake, New York) and anatomic material examined before the name *Amnicola* can be properly and permanently allocated either taxonomically or biologically.

OUR WEST COAST MARINE FAUNA

By A. SORENSEN

Any young person in a West Coast high school who takes biology as his major has a wonderful opportunity before him. He can specialize in any branch of biology that he likes with the assurance that nowhere else has he a better chance to find nature in all its richness. And if he goes in for marine biology, then he has the Pacific Ocean and its myriad of life before him.

The shore line from Alaska to Panama furnishes specimens of mollusks, crustacea and echinoderms of a wide and interesting variety, and with all this material before him it is no wonder that the schools and colleges are crowded with enthusiasts, many of whom should prove noted scientists in the future.

Several wide awake and nationally known conchological clubs exist on the West Coast and their influence is constantly increasing.

At this point, as W. Clench and P. Bartsch so forcefully emphasized at the recent meeting of the Malacological Union in Washington, D. C., the numerous amateur students and collectors all over the country should be encouraged, and even urged, to send in to our museums or other recognized centers of learning, full information about their finds and discoveries. Such information should not only give a detailed description of the specimen, but it should also give the exact time and the place where it was found.

In this way, science will be advanced and much new information secured, both as to the new species and the extention of range of previously known species. The necessity for such voluntary information should be obvious, for it is a well known fact that our centers of higher learning are badly understaffed and overworked and but limited opportunity is given for field work, so if the work of amateurs is well coordinated much benefit should result all around.

Originally it was intended that this article should confine itself to mollusks, preferably those from deep water, so we had better get to work.

During the war, many beaches, bays and inlets were closed to the public and so were also such strategic headlands as Point

Pinos, Point Firmin, Point Conception and Point Loma, all well known to conchologists. Only recently they are being opened and joy reigns again among shore collectors. Commercial diving for abalones and drag-netting for bottom fish were also restricted and they are not yet in full swing.

It is hard to tear oneself away from shore collecting where both univalves and bivalves are so plentiful. The rocky shores provide many species of *Acmaea, Thais, Littorina, Oliva, Chiton, Murex,* etc., while on the sandy beaches are found a multitude of clam-like bivalves both large and small.

But occasionally the collector finds something that puzzles him. It is something the waves have washed up or it may be that a hermit crab has brought a shell in far from its home in deep water. The strangeness of these specimens that evidently are not from the intertidal zone sets him to wishing that he could explore the ocean depths or at least could learn some of its secrets. Sometimes after storms, large pieces of shale-rock may be found on the Monterey beaches. They are honey-combed with passages of piddocks, the rock boring clams. One such rock contained four large live *Pholadidea californica* Conrad. They were from four to six inches long and three inches in diameter. Other pieces contained *Botula falcata* Gould, *Lithophaga attenuata* Desh., *Irus lamellifera* Conrad and other species of rock-borers. These rocks came from a ledge in ten to twenty-five fathoms.

Now he is fully interested and soon makes arrangements with the operators of so called drag-net boats to go out with them.

When the sardine season closes in February, several of the smaller purse-seine boats begin drag-netting for soles, flounders and other bottom fish.

The southern half of Monterey Bay has a fairly smooth bottom north for about fifteen miles and out for ten miles and to about one hundred fathoms after which the depth increases rapidly. Here is where the boats operate and their nets bring up, besides the fish, different species of mollusks, crabs and star-fish, and here is where the conchologist comes in. Ordinarily, everything that is not a commercial fish is washed overboard, but after you get the crew interested, they soon learn to pick out what you want.

Drag-netting is an interesting process and requires special equipment and much skill. The so-called otter-trawl, in common use, is a purse-net of heavy construction with side nets or wings that are kept open with spreader-boards heavily weighted and so connected that, when the boat pulls forward, the boards move sidewise at an angle and thus open the net. Heavy lines or cables are used and they are let out to three times the length of the perpendicular depth of the water, so when the net gets out to seventy-five fathoms it is a quarter of a mile behind the boat.

The California law forbids drag-netting inside of twenty-five fathoms and this is rigidly enforced.

Of the mollusks most frequently taken are *Polinices draconus* Dall in thirty to sixty fathoms and *Eunaticina oldroydi* Dall, in forty to eighty fathoms. Neither of these lives in shallow water like the *Polinices lewisii* and *P. reclusiana,* but at times empty shells are brought in by hermit crabs. The lewisiis and reclusianas are very plentiful in Morro Bay, Newport Bay, Mission Bay and in parts of Puget Sound, but never in deep water.

Watching closely on deck when the net is emptied one may occasionally get the beautiful *Surculites carpenterianus* Gabb or a *Chryodomus tabulatum* Baird or a stray *Cancellaria cooperi* Gabb or different species of *Nassarius.* If the net has come across crabs you are sure to get *Randalia ornata* Randall closest in, then *Murcia gaudichaudii* Milne Edwards and *Lopholithodes foraminatus* Stimpson and several species of spider crabs. The *Lopholithodes foraminatus* lives only on a sandy or muddy bottom and not in the rocks like the *Lopholithodes mandtii* Brandt which it closely resembles. Both are decapods (ten legged); still they have only eight visible legs, for the last pair, in vestigial form, are found under the carapace and within the body. What strange things evolution is doing.

It wouldn't do to omit mentioning the many kinds of starfish brought up, especially the basket star (*Gorgonocephalus caryi* Lyman) with its hundreds of tendril-like rays, or the twenty-rayed *Pycnopodia helianthoides* Brandt which attains a size of thirty inches and the still lower forms Aphrodita (sea

mouse), Crinoids (sea lilies), rose colored sea pens and the five foot long *Balticina finmarchica* Nutting. If you were not satisfied with the amount of mollusks found you could examine the stomachs of the soles and you would get many shells of *Yoldia scissurata* Dall, *Yoldia ansifera* Dall, *Yoldia thraciaeformis* Storer, and *Leda taphria* Dall and others.

The *Eunaticina*, previously mentioned, is one of the mysteries of the deep. The fishermen call it the long seasnail. It is five to six inches in length with a shell only one and a half inches in diameter which is very thin and brittle and only a very small part of the animal can be concealed within the shell. It is unlike the *Polinices lewisii*, which although very large when extended can expel the water contained in cells within its foot and then reduce its size to fit the shell.

The *Eunaticina* has no water in cells, hence cannot reduce its size. Nor has it an operculum, so it is reasonable to suppose that it will ultimately become a true slug.

On one trip, the net passed through an egg mass attached on the bottom. They were the eggs of the Pacific squid (*Loligo opalescens* Berry). They filled the net completely and the egg clusters were so attached to the net walls that it was a real job to clear it and separate the fish from this slimy mess. A boat a half mile away had a similar experience. Many thousand tons of squid are brought in to Monterey annually. Some are frozen and shipped to Eastern markets, but most of them are canned and sold in Latin countries.

The drag-net boats explore the smooth sandy bottoms pretty well, but it takes the fully equipped deep sea divers to study the rocky bottoms. These divers work in from twenty to one hundred and twenty feet deep for *Haliotis* for the market. Here on the West Coast *Haliotis* are called abalones, in the East they are known as ear shells, in England as ormers and in Australia as mutton fish. They make delicious eating and therefore are much sought after commercially, especially the large *Haliotis rufescens* Swainson which grow to ten or eleven inches in length. The general public may take them along the shore if seven inches in size, while commercial fishermen can take only those from eight inches up and only in twenty feet or deeper.

It was the good fortune of the writer to get acquainted with

one of the very best deep-sea divers on the Coast, Mr. Delmer Revica, who has done valuable investigating for the California Fish and Game Commission, besides other important deep sea work.

While out with him, and learning from his experience, it was easy to establish the varying depths at which the different species of *Haliotis* live. The black abalone, a smaller species (*Haliotis cracherodii* Leach), is a shore dweller and very rarely is found outside of twenty feet deep. But the large *Haliotis rufescens,* the real commercial abalone on the California coast, lives on and among the rocks from the shore out to sixty or eighty feet deep. It is strictly a vegetarian and feeds on the short algae which it rasps off with its long tongue or radula. From forty or fifty feet out to one hundred feet, two smaller species are found. The most common of these is *Haliotis assimilis* Dall.

But on one trip, Mr. Reviea sent up to the boat some smaller ones, somewhat resembling *Haliotis assimilis,* but with other variations. The writer sent some of them to the U. S. National Museum where Dr. Bartsch pronounced them a new species and named them *Haliotis aulaea.*

At these outer depths Mr. Reviea also located several northern species that are shore dwellers in their native haunts, namely, *Haliotis kamtschatkana* Jonas and *Haliotis wallalensis* Stearns. This was along the San Luis Obispo County Coast.

On another trip between Point Conception and Santa Barbara a diver brought up four large pink abalones altogether unlike the *Haliotis rufescens* which they most resembled. In Washington, Dr. Bartsch described them as new and honored the writer by naming them for him. They were evidently strays from farther south for they have since been found south to Cedros Island off the Mexican coast.

Haliotis fulgens Philippi is the beautiful green abalone found from Los Angeles south to Point Lucas at the south end of Baja California, Mexico. On the south half of this peninsula, there is also found a subspecies named by Dr. Bartsch *Haliotis fulgens turveri* for a friend who regularly goes to Mexico with the writer. *Haliotis corrugata* Gray is also a southern species, but occasionally found as far north as Morro Beach. Nearly fifty species of

Haliotis have found their way to the writer's collection from many parts of the world.

That mollusks that normally live in the shallow waters of Bering Sea and along the Alaskan coast may be found in quantities off the California coast, but in extreme deep water, was positively demonstrated recently.

Fishermen from Monterey and Santa Cruz rigged up to fish for the so-called black Alaska cod which in this latitude lives in from twelve hundred to three thousand feet depth. They had good luck getting cod, but they also had a new experience for when they fished on rocky bottoms off Santa Cruz many of their hooks brought up a number of different kinds of shells that they had not seen before. These shells had from one to half a dozen sea-anemones growing on them and when a fish hook caught in one of these tough bodies up came the whole mollusk to the boat. One of the fishermen was thoughtful enough to bring a good quantity to the dock several times. Among these were: *Argobuccinum oregonensis* Redfield; *Cancellarea cooperi* Gabb, *Chrysodomus tabulatus* Baird; *Spirotropis perversa* Gabb; *Chrysodomus ithius* Dall, and *Colus severinus* Dall. In addition, the hooks brought up such rare crabs as *Chionoecetes tanneri* Rathbun and *Paralithodes rathbuni* Benedict. And, ordinary dredging in ten to twenty-five fathoms in Monterey Bay generally brings good results.

A NEW SUBSPECIES OF MONADENIA FROM NORTHERN CALIFORNIA

By ROBERT R. TALMADGE, Eureka, California

MONADENIA FIDELIS TRINIDADENSIS, new subspecies.

Shell similar in general features to *M. fidelis subcarinata,* but much smaller and rougher in physical appearance. Shell solid, slightly polished at base, with open umbilicus, partially covered by the narrow peristome. Spiral sculpture prominent on first and second whorls. Periostracum generally worn off of the apex of spire, often down to third whorl. Some specimens slightly keeled. Color of shell horn brown, but spire often with

greyish tinge, due to worn periostracum. On some specimens, a faint light band may be distinguished on first whorl.

Measurements (average of 20 shells): maximum diameter 28.5 mm., minimum diameter 24 mm., altitude 17.5 mm.; whorls 6¼.

Holotype in Talmadge collection; paratypes in same collection, in collection of S. Stillman Berry, and no. 182505, Academy Nat. Sci. of Philadelphia.

Type locality: Little River Rock, about 3 miles south of Trinidad, Humboldt County, California, and ¼ mile out to sea. Four examples gathered on 2 June, 1946. Additional locality: an unnamed rock about ½ mile north of Little River Rock; 16 examples collected.

So far as known, this subspecies inhabits only the grass-covered off-shore rocks. How their ancestors reached these rocks is unknown, but, in the writer's opinion, the separation from the closely related mainland subspecies is definite, although *M. f. trinidadensis* may be a dwarf form of the mainland *subcarinata*. The lack of food and the exposure to the elements would have a decisive effect on animal life. All living specimens were taken either in the grass or from natural crevices in the rock.

ON THE ANATOMY AND THE SYSTEMATIC PLACE OF THE LAND-MOLLUSK GENUS JANULUS

By HENRY A. PILSBRY

The genera *Gastrodonta, Zonitoides, Ventridens, Striatura* and *Poecilozonites,* composing the subfamily Gastrodontinae, are all confined to North America with the exception of several palearctic species of *Zonitoides,* which are either closely related to American species (*Z. excavatus* Bean), or identical with them (*Z. nitidus* Müll.)

From this it might be inferred that the subfamily had its genesis in America, a few species invading the Old World only in Pliocene or later time. Wenz, 1923, referred several European Paleocene and Miocene to Recent species to *Zonitoides;* but with no intention of casting doubt upon his classification, which is probably correct, it must be admitted that the shell characters

of these small, simple Zonitidae are sometimes hardly distinctive enough for positive generic allocation. By themselves, these fossils would hardly be thought conclusive evidence of Gastrodontinae in European Tertiary.

There is, however, another European genus having some conchologic resemblance to certain Gastrodontinae. I refer to *Janulus* Lowe,[1] represented by about a dozen species from Upper Oligocene to Pliocene of middle Europe, two living species in Madeira and one in the Canary Islands.

Janulus has been variously classified. Wenz (1923)[2] formed a subfamily Janulinae in the Zonitidae for *Janulus* only. Pfeffer, 1929,[3] proposed Janulinae anew for *Janulus* and the Mexican *Pycnogyra*,[4] the numerous whorls and the narrow aperture being given as its chief characters. Thiele [5] placed *Janulus* in the Endodontidae, but gave no new information upon its structure beyond a brief account of the radular teeth, quoted below.

Information on the anatomy of *Janulus* up to this time relates to the jaw and teeth of *J. stephanophora* (Desh.) and *J. bifrons* (Lowe), examined by W. G. Binney, 1879.[6] He described the jaw of *Janulus stephanophora* (Desh.) as "strongly arched, ends pointed, cutting margin with a sharp, greatly produced median projection." He says of *J. bifrons* (Lowe): "Jaw smooth with median projection. Lingual membrane with 34–1–34 teeth, of which 4 on each side are laterals. All as in *Zonites*, i.e., centrals tricuspid, laterals bicuspid, marginals aculeate." No figures were given.

The only further note on the anatomy which I have found is by Thiele [7] in his generic definition of *Janulus:* "Mittel- und Seitenplatten der Radula mit inneren und äusseren Nebenzacken." This does not agree with Binney's observations and is

[1] *Janulus* Lowe, 1852, Ann. Mag. N. H. (2) 9: 115, for *Helix calathus* Lowe.

[2] Fossilium Catalogus 1, pars 17, p. 300.

[3] Geol. u. päl. Abhandl. 17 (21), Heft 3, p. 33.

[4] See H. B. Baker, 1928, Proc. Acad. N. S. Philadelphia 80: 27.

[5] Handb. Syst. Weichtierkunde 1: 576.

[6] Bull. Mus. Comp. Zool. 5: 332, 333; repeated in 1884, Ann. N. Y. Acad. Sci., 3: 87.

[7] Handbuch Syst. Weichtierkunde 1: 573.

wholly at variance with mine. Species of *Oxychilus, Vitrea* and some related genera have tricuspid lateral teeth, but such teeth are not known in Gastrodontinae. Unfortunately Thiele did not mention from what species his note on the teeth was taken. I imagine that he misread Binney's description.

I have examined *J. bifrons* (Lowe)[8] from Madeira. The sole is plain, not tripartite; pedal groove deep, the foot-fringe below it is vertically grooved. No noticeable caudal pit seen.

The lung (fig. 3) is plain, showing no venation except the principal pulmonary vein. The rather narrow wedge-shaped kidney is about one and one-half times the length of the pericardium and contained about two and a half times in that of the lung. The secondary ureter appears to be complete.

The genitalia (figs. 1, 2) show a long atrium from which the oviduct, spermathecal duct, penis and dart-sac branch at about the same level, no vagina being developed. The long, rather thick penis terminates in a short stout epiphallus leading to a short vas deferens. The penial retractor is terminal on the penis. The dart-sac seated on the base of the penis, is arcuate, a very short connective from its summit to the spermathecal duct. No dart present (probably dissolved by the preservative). There are no coronal glands. A short duct (d) from the oviduct enters a sheath which envelopes the lower part of the penis (stippled in figure 1). It has no connection with the spermathecal duct. The free oviduct is long. The spermatheca is ovate, on a rather long duct. Other details of genitalia are as shown in the figures. My preparation of the posterior part was imperfect in detail owing to the vary hard material.

The jaw (fig. 4) is high-arched, smooth, without noticeable median projection on the cutting edge.

The radula has 24–1–24 teeth (fig. 5). Central and lateral teeth have single long cusps with overhanging edges, no ectocones. Marginal teeth with long curved cusps of the usual zonitid form.

The conflicting accounts of the teeth are perplexing. If

[8] The two specimens dissected were sent me by the Rev. R. Boog Watson in 1895; probably were collected some years earlier; and have therefore been in alcohol over fifty years. Having evidently been placed directly in strong spirit, they were contracted well within the shell and very hard.

Janulus bifrons (Lowe). Fig. 1, Genitalia. d, peni-oviducal duct; ds, dart-sac; epi, epiphallus; ov, oviduct; p, penis; sp.d., spermathecal duct. Fig. 2, Outline of genitalia of another individual. Fig. 3, Pallial region. Fig. 4, Jaw. Fig. 5, Central, two lateral, and 9th, 15th, and 20th marginal teeth.

Fig. 6, *Pyrgulopsis archimedis*, n. sp.; camera outline of holotype.

Fig. 7, *P. nevadensis* (Stearns); camera outline of shell (2874a, probably not fully mature) from type locality.

Thiele's data for the genus are correct for *J. calathus*, the genotype, then *J. bifrons* stands at least as a subgeneric group. However, we do not know what species Thiele had in view, and the teeth of *J. bifrons* as described by W. G. Binney do not agree with the radula before me. These conspicuous discrepancies call for a new study of *Janulus* radulae.

Summary: From the structure of the genitalia, it is obvious that *Janulus* belongs to the subfamily Gastrodontinae. The absence of coronal glands on the dart sac is a special feature though not unique in the subfamily, but otherwise the genitalia do not differ much from those organs in the genus *Gastrodonta*.[9]

It appears that the Gastrodontinae were represented in Europe at least as early as middle Tertiary, and up to the present time in Atlantic islands. Whether the subfamily arose in the Nearctic or the Palearctic areas is still undecided.

REPORT ON THE LAND MOLLUSKS OF CAPE MAY, N. J.

By ROBERT C. ALEXANDER

From Manasquan Inlet above Bayhead south to Cape May at the mouth of Delaware Bay, sandy island beaches flank the Atlantic coast of New Jersey. These beaches are separated from the mainland by bays, sounds, thoroughfares, and wide salt marshes penetrated by creeks winding far back to fields and woods at the edge of higher ground. After a collecting trip to this region, Dr. Henry A. Pilsbry wrote, "The littoral of southern New Jersey is perhaps as unpromising collecting ground for the land shell hunter as can be found in the eastern states."

Cape May is the only place on this part of the coast which offers even a moderately congenial environment for land snails. Here, good soil, extending down to the ocean, enables vegetation of the upland to intermingle with vegetation of the coastal region. This is particularly apparent at Cape May Point where woods of large deciduous trees, pines, cedars and holly are

[9] Land Mollusca of North America 2: 427, fig. 230.

found next to the scrub and the bayberry, beach plum, groundsel, and dwarf sumac of the beaches. However, Cape May is isolated as far as a land snail fauna is concerned by a vast cedar swamp, stretching all the way across the northern part of the Cape May peninsula from the seacoast to the bay, and by the pine belt of the interior.

The tip of Cape May, cut off from the mainland by a tidewater canal dredged from Delaware Bay to Cape May Harbor in 1942, has become a triangular island six miles long on the ocean side and two miles long on the bay side. My collecting was confined to this island, most of it being done at Cape May Point, Cape May City, and South Cape May within half a mile of the ocean.

In September, 1945, I discovered a small full-grown *Triodopsis albolabris maritima* (Pilsbry) clinging underneath the bottom of an upturned cardboard box lying by the side of the road around Lily Lake at Cape May Point. A year later, I found a larger shell of this species, with the dead animal in it, between the tracks of the spur railroad to Cape May Point where it passes a small woods a few yards west of Bayshore Road.

The shell of the first specimen measured 15.8 mm. from the base of the lip to the tip of the spire and 21.7 mm. at its greatest diameter. The second shell was 18 mm. in height and 24 mm. in diameter.

The diminutive form inhabiting the cape is commonly associated with a sandy soil. Judging by collecting records, it is fairly abundant here. Bryant Walker distinguished it from *T. albolabris* proper as being less than 24.5 mm. in diameter. The subspecific names *maritima* (Pilsbry) and *traversensis* (Leach) formerly applied to this form are now regarded as forms of albolabris by Dr. Pilsbry. The name *maritima* is retained here only as a matter of record.

Collecting at Cape May Point the morning of October 4, 1946, I excavated three empty shells of *Strobilops labyrinthica* (Say), a solitary shell of *Vertigo pygmaea* (Drap.), and a living *V. milium* (Gould) from the earth at the base of a cedar tree in a cedar grove on the south side of Sea Grove Avenue a short distance east of Lighthouse Avenue. Most of the cedar trees here are covered with the vines of poison ivy, many almost to the point of strangulation. Being susceptible to this toxic nuisance,

I was glad to find a tree in the grove comparatively free from it where I could proceed with my collecting without the prospect of unpleasant consequences. Numerous shells and living specimens of *Zonitoides arboreus* (Say), probably the most widely distributed species of land snail on the cape, were found among debris half-buried in the ground in the grove.

On more than one occasion, I have collected both *Zonitoides arboreus* (Say) and *Deroceras laeve* (Müller) on the shore of Lily Lake.

Long ago, the ocean, two inlets, and one or more creeks completely surrounded the land occupied by Cape May City, and South Cape May too, with salt water. Until the name was officially changed to Cape May City in 1868, it was appropriately called Cape Island. At some unrecorded time when the west inlet was filled in, and later, when a part of old Cape Island Creek was piped underground, the island joined the mainland. With the construction of the canal, Cape May City has reverted to its earlier status of being situated on an island.

Collecting in the old long-settled section of the city, Dr. Pilsbry reported finding *Vallonia pulchella* (Müller) and *Pupoides marginatus* (Say) quite abundant on mounds around the tanks at the gas works on Lafayette Street in August, 1898. He suggested that these might possibly be imported species since they were not found anywhere else. Although the gas works is still located at the same place, it has been fenced in and is no longer accessible for collecting.

I visited this part of Cape May the afternoon of October 4 and found numerous *Vertigo pygmaea* (Drap.), a few *Zonitoides arboreus* (Say), and two medium-sized *Limax maximus* Linne. These mollusks were living under the wet portion of a discarded paper cement bag lying on the ground under a privet hedge just outside the fence of the gas works and behind the 8th tee of the golf course.

I had seen *L. maximus* at Cape May before. From what I have heard, this immigrant from across the ocean is well-established in certain sections here.

One dull wet day in September, 1945, I noticed a large *L. maximus* stretched out on the bottom step of the front steps at 711 Kearney Avenue, a corner house on filled-in ground one block

directly back from Convention Hall Pier. Two others were found under a board beside the steps.

The family occupying the house told me these big slugs often crawled into the food dish of their Irish setter and ate the dog's food. As many as five of them had been counted in the dish at one time. The dog, a discriminating creature, refused to have anything to do with the food after the slugs had been in it.

An unusually wet summer may account for the presence of *Limax maximus* at that ocean front location. Last summer was dry and no slugs were seen there.

On October 6, I found three living *Cochlicopa lubrica* (Müller), *Zonitoides arboreus* (Say), and a small colony of *Mesodon thyroidus* (Say) ranging from young to full-grown ones under half a dozen discarded paper cement bags scattered on the sand among dune grass a few feet in from the sidewalk on the west side of Broadway and a few yards to the ocean side of old Cape Island Creek at the place where it comes out into the open after being piped underground and goes off through the meadows toward South Cape May. This place is about a block and a half from the ocean.

Dr. Pilsbry has pointed out that, compared with typical specimens, the shells of *Mesodon thyroidus* (Say) found on the coast of New Jersey are "thin and light, much smaller, generally more globose and conoidal, although this latter character is variable." My specimens were no exception. The largest shell measured 12.5 mm. in height and 17.7 mm. in diameter. This shell has the parietal tooth, often lacking in specimens from this region.

On October 12, I found two specimens of *Deroceras reticulatum* (Müller) on the bottom of wet sheets of cardboard lying in the grass under mulberry bushes between the 8th green of the golf course and Lafayette Street, almost at the end of Madison Avenue. That same day, I went to South Cape May to try to rediscover *Succinea aurea* Lea.

(*To be Continued*)

DR. BLENN R. BALES

Malacologists in general and the Florida shell collectors in particular lost an enthusiastic and accomplished colleague with the passing of Dr. Blenn R. Bales. He died at his Circleville, Ohio, home on October 25, 1946, at the age of seventy years.

Dr. Bales was born July 18, 1876, at Lilly Chapel, Madison County, Ohio. He was a graduate of Starling Medical College, and did post-graduate work at the Lying-In Hospital, New York City. He was married in 1900 to Mary E. Jones, who is almost as well known to Florida shell collectors as the Doctor, as she was the companion of all his journeys. For forty years, Dr. Bales was surgeon for the Norfolk and Western Railroad. During the Spanish-American war, he served in hospitals in Puerto Rico. His civic interests were many. For years he served as director of the annual festival known in Circleville as the "Pumpkin Show." He was a member of the Methodist Church and was also active in Masonic work.

An intense interest in the natural sciences was a vital part of his personality. At one time, he made an extensive collection of birds' eggs, which is now in the museum of Ohio State University. Later he operated the Triangle Flower Farm near Circleville, where he was interested in the development of new varieties.

His untiring efforts in collecting mollusks were well known to his many friends. For many years, the Doctor and Mrs. Bales spent several months in Florida, mainly on the Keys, where they would stay on the chosen key in one of the cabins erected for fishermen. The finest fish and lobsters in the world were always in abundance, and other supplies could be had from the daily stage from Miami to Key West. In this way, Doc Bales, as he was affectionately known to Florida naturalists, collected all the way from Key Largo to the Tortugas.

In Ohio, the Doctor had collected land and fresh water shells, but in Florida he specialized on the marine fauna. Most of his collecting was confined to shallow water and the intertidal zone, where his success was partly due to the use of various original devices, but chiefly to his tireless patience in exploring every possibility of the bottom he was working. Few mollusks were

well enough hidden or camouflaged to escape his eye. Some of his methods were described briefly in his articles in The Nautilus and elsewhere, but the details of much of his lore were known only to those who had the opportunity to collect with him.

In 1939, the program was varied by a trip by car to Mexico, where large collections were made around Acapulco.

Dr. Bales was a member of the American Malacological Union, attending most of the meetings until the last one. His passing is a loss to malacological science, as well as a personal grief to his many friends. Several species named in his honor will serve to keep his memory green.

NOTES AND NEWS

A NEW NAME IN PANAMA HYDROBIINAE.—James Zetek has recently called my attention to a necessary correction of the San José Island non-marine mollusk report. The name *Zetekella* Morrison, 1946, Smith. Misc. Coll. 106 (6) : 11, was unfortunately still-born, cheated of breath by absolute homonymity. It was preoccupied by *Zetekella* Drake, Sept., 1944, Bol. de Entomol. Venezolana 3 (3), in Hemiptera. Because of the continued desire to have this characteristic group of mollusks bear a name commemorative of the work of Zetek in the Panama Region, the molluscan genus is hereby given the new name Zetekina, with the same genotype: *Littoridina frenata* Pilsbry (1935) = *Zetekina frenata* (Pilsbry).—J. P. E. MORRISON.

CEPAEA HORTENSIS.—Last year, I found two varieties of this species at East Boothbay, Maine.—HOWARD GILMORE.

STROMBUS SAMBA CLENCH IN FLORIDA.—A fine adult example of *Strombus samba* Clench was collected recently by Mr. Rex R. Benson (guest of the author) in Lake Worth, Florida. It agrees perfectly with the figures and description given by Mr. Clench in "Johnsonia," no. 1, even to the brownish color on the inner lip. The shell measures 180 mm. in length by 137 mm. in width, and contained a considerable portion of the animal when found. So far as I am aware, this is the first record of this species in Florida.—A. HYATT VERRILL.

A SNAIL CAPTURED BY AN INSECTIVOROUS PLANT.—In the summer of 1940, Dr. Walter R. Sweadner, entomologist at the Carnegie Museum, found a snail caught in a leaf of the Venus flytrap, *Dionaea muscipula* Ellis. The incident occurred near Wilmington, N. C. This insectivorous plant has the leaf divided by the midrib into two semi-circular lobes fringed with long stout teeth. In the center of the upper side of each lobe are three sensitive hairs, which, when irritated, cause the leaf to fold along the midrib. This plant has the fastest movement of any known plant. Digestive juices are secreted by small glandular hairs on the leaf surface. Normally the plant feeds on insects.

The snail captured was an immature *Triodopsis albolabris* (Say) of four whorls. The measurements of the shell are: Greatest diameter 13.0 mm., least diameter 10.8 mm., height 8.9 mm. The leaf was too withered to measure satisfactorily, but the lobes had a length of about 20 to 25 mm. This is apparently the first time such an incident has been observed.—CHARLES B. WURTZ.

CONCERNING "HYDROBIA" JENKINSI E. A. SMITH.—*Hydrobia ventrosa carinata* J. T. Marshall and *Hydrobia jenkinsi* E. A. Smith were published simultaneously. This is proved by their printing on opposite sides of one leaf of the Journal of Conchology, VI (Oct. 1889), pp. 141 and 142, respectively. Also, the statement is made by E. A. Smith on p. 143 that they were intended to be published "side by side," and that they concern the same form of snail. No one doubts their identity.

J. T. Marshall, remarking further on this snail in April, 1890 (J. of C. 6: 224), remains unconvinced of its status as a distinct species, yet omits any mention of his *carinata*. On page 242, Mr. A. J. Jenkins (the species' collector) was reported to have read a paper April 2nd, 1890, on the difference in habits of *H. jenkinsi* Smith and *H. ventrosa* Mont. There is no mention here of *carinata*. In July, 1890, E. A. Smith replied anew (J. of C. 6: 244) to Mr. Marshall's opinion. Smith here implies, without stating so in so many words, that *H. jenkinsi* and *H. ventrosa* must be different species, because they live together (without intergrades) "in the same ditches." On these pages likewise there is no mention of *carinata*.

Therefore, since the first subsequent reviewers or revisers, the three persons most intimately concerned with the species, namely: Marshall, Jenkins, and Smith, all used the name *H. jenkinsi* in 1890, and completely dropped the name *H. v. carinata,* this must be taken as a fixed selection. Incidentally *H. jenkinsi* is not a member of the American genus *Lyrodes.* The opinion of Oscar Boettger, stated in Smith's original description, that *H. jenkinsi* is most closely related to the Tasmanian (and New Zealand) species of *Potamopyrgus,* remains the best idea as to the source of this introduction to Europe. In my own opinion, based on shell characters, it comes close to being identical with *Potamopyrgus corolla* (Gould) from New Zealand. Parthenogenesis, such as *P. jenkinsi* exhibits, should be looked for in the New Zealand snails. As stated previously, the only animals available to me were those of *Potamopyrgus antipodarum* Gray (Nautilus 52: 87). To my knowledge, *P. corolla* (Gould) has not been examined anatomically.—J. P. E. Morrison.

Tegucigalpa, Honduras, excerpts from letters.—Dec. 29: "We have been here about three months, and have had a very successful time with the insects. But you will hardly believe it when I tell you that in all this time we have not found a single shelled snail (though there are slugs, *Veronicella* and *Agriolimax*) until today, when under a log we found the little snail. . . . We expect to return to Colorado in the spring or early summer." Jan. 1: "The student (Cisneros) who found the snail, about which I wrote you the other day, today came in with an adult of the same species about 14.5 mm. long. The first one found was evidently quite immature. The species is, I think, certainly *Bulimulus corneus* Sowerby. It agrees very exactly with Pilsbry's figure."—Theo D. A. Cockerell, Escuela Agricola Panamericana.

Type of Elephantellum.—Dr. Joshua L. Baily has called my attention to the fact that I inadvertently cited *Caecum hexagonum* Carpenter as type. This type designation should have been *Caecum heptagonum* Carpenter. Making that correction will give the genus its proper status.—Paul Bartsch.

AMNICOLA AND EUAMNICOLA.—Since Dr. Morrison has spoken to me about the matter, I perhaps will be forgiven a few expressions of opinion in regard to his paper on *Amnicola*, which appears in this number. Morrison's disinterment of *Amnicola* "Gould & Haldeman" Haldeman (July, 1840), type *Paludina lustrica* Say, seems legally sound, although neither Haldeman nor Lea, who both believed in the validity of oral description, had any scientific right to throw what was primarily Gould's *Amnicola* into the limbo of unidentifiable names. Of course, any attempt to recognize a "nomen dubium" of 125 years standing would be ridiculous. But, although the ANSP. shell (a *Pomatiopsis*) obviously cannot be the type specimen of *Paludina lustrica*, it still remains the only known example which was identified by Say himself as his species. (For that matter, no museum specimen, even if designated "type" by the author of a species, conveys any legal evidence.)

However, the scientifically proposed but legally preoccupied *Amnicola* Gould (1841)[1] must be considered independently, and Herrmannsen (1846) made a perfectly valid choice of type for it. Fischer and Crosse (1890, p. 254) also definitely stated that the type of *Amnicola* was *Paludina porata* = *P. limosa* Say, which means that Pilsbry's (1943) selection of *Amnicola porata* (Say) as the type of *Euamnicola* F. & C. (1891) was certainly valid, if not actually predetermined. For these reasons, the well-known *Amnicola* "G. & H." Gould (1841) legally should be replaced by *Euamnicola* F. & C., with *Marstoniopsis* as a subjective synonym; and *A.* (*Marstonia*) *lustrica* Pilsbry was preoccupied by a doubly dubious binomial.

All this discussion brings out the most dangerous weakness of our present international rules. "Nomina dubia" (i.e., unidentifiable names like *Amnicola* Haldeman and its type species), names proposed in synonymy (not accepted by their authors)[2] and misspelled names (including most "emendations") should

[1] Haldeman's (July, 1840) original proposal of *Amnicola* was not noticed by either Gould or Herrmannsen (or by anybody else except Lea and Morrison). In fact, from the date of his manuscript, Gould must have been completely unaware of Haldeman's rash footnote, and certainly (p. 230) was dubious about Say's *Paludina lustrica*, which means that it never could become the type of Gould's *Amnicola*.

[2] For example, *Cardita bailyi* Baily, 1945, Nautilus 58: 119.

have been given the status of nude names, which would mean that, for all practical purposes, they would cease to exist. Such a rule would have eliminated much of the hopeless trash that encumbers our synonymies. Also, it would have encouraged students to wipe out impulsively innovated names (like Haldeman's *Amnicola*) or to date them from conscientious proposals (like Gould's). On the other hand, the present rules and opinions invite us to waste quires of good white paper in ludicrous attempts to identify the unidentifiable.—H. Burrington Baker.

Odontostomus odontostoma and Cyclodontina pantagruelina.—Dr. Lothar Forcart, in his proof [3] of the correct type of *Odontostomus,* also attempted to resurrect two dubious specific names. *Helix gargantua* Férussac (1832)[4] was a synonym of the prior *Odontostomus odontostoma* (Sowerby, 1824), although Férussac considered it a distinct species. But, *Helix gargantua* Férussac (1821, Prodr.) was a shell "de plus de deux pouces (54 mm.) de longueur" (about 1.5 times as long). Similarly, *Scarabus labrosus* Menke (1828 and 1830), like almost every other new name in the "Synopsis," was only rendered identifiable by later publications. Its 1828 status was not improved by the fact that Moricand (1833) included it in the synonymy of his *Helix pantagruelina;* and *Cyclodontina p.* (Moricand) remains the valid name for the species, even if *S. labrosus* also be dated from Moricand (1833). But legally, if one accepts the mischief-making Opinion 54, a "nomen dubium" never can acquire any other status.—H. B. Baker.

The type of Orthalicus.—In a former number, Dr. Rehder [5] has published very logical and convincing proof that Müller (1774) probably had seen shells of *Orthalicus maracaibensis* (Pfr.), when he described his *Buccinum zebra.* But, both Pilsbry and Rehder seem to have missed two points: (1) *O. zebra* Beck (1837) is not *O. maracaibensis;* and (2) Beck proposed *Orthalicus* as a subgenus of "*Bulimus,*" although he used the binomial *O. zebra.* Herrmannsen (1847) named *Bulimus zebra*

[3] 1946, Nautilus 60: 59.

[4] Histoire, Expl. pls. livr. 22–27, pl. 163: "Fig. 1. *Helix gargantua,* Nob. Prodr., no. 510" Fig. 2 is labeled "*Helix odontostoma,* Sow."

[5] 1945, Nautilus 59: 29–31, with foreword by Pilsbry.

as the type of *Orthalicus*, which apparently means that he made a valid selection of (*Bulimus*) "*O. zebra* (O. Müll.) B.,"[6] which was identified as *Oxystyla ferussaci tricincta* (Martens) by Pilsbry.[7] Incidentally, so far as I can remember, Rehder was the first writer to use "The genus *Orthalicus*" . . . "for the group now known as *Oxystyla.*" Legally he was right.

But, let us return to *Buccinum zebra* Müller (1774). According to article 31 of the international rules: "The division of a species into two or more restricted species is subject to the same rules as the division of a genus." As Clench wisely has recognized in "Johnsonia," this plainly means that article 30 on type designation gives the legal method to employ if one wishes to adopt such a complex old "nomen dubium" as *B. zebra*, which included achatinids as well as species of *Orthalicus*. Apparently Fischer and Crosse[8] were the first authors to attempt such a type designation. For these reasons, the type of *Buccinum zebra* Müller (1774) is that specimen of *Orthalicus undatus* (Bruguière, 1792) which Müller included in his composite species, either among shells which he had seen or by citation of previous figures. Now, some enterprising bibliophile should gather together all the attempts to identify *B. zebra*, and bind them into a nice fat quarto volume, but probably should be careful to insert "To be continued" on the last page.—H. B. Baker.

PUBLICATIONS RECEIVED

The genus Bankia in the western Atlantic. By William J. Clench and Ruth D. Turner. Johnsonia 2(19): 1–28, figs. 1–16, 1946. This thorough revision, mainly based on the exquisitely figured pallets, sets a new high mark for "Johnsonia," from the standpoint of original contributions to the known taxonomic characters. The shells are equally well delineated. New

[6] The shell shown in Férussac, Histoire, pl. 115, fig. 5, now selected as type. According to Strebel and Pfeffer (1882, Beitrag 5: 24), Beck studied Müller's collection.

[7] Manual of Conchology (2) 12, p. 121; written 2 years before there were any international rules and 8 years before their present article 30. The wonder is that Pilsbry anticipated them as closely as he did.

[8] 1873, Mission au Mexique, Moll. terr. & fluv., vol. 1: 441–447.

subgenera and species are: *Bankiopsis*, type *Bankia caribbea*, *Liliobankia*, type *B. katherinae*, *B.* (*Neobankia*) *destructa*, *Plumulella*, *B.* (*P.*) *fosteri* and *B.* (*P.*) *cieba*.—H. B. B.

The genus Mya in the western Atlantic; the family Haliotidae in the western Atlantic. By Richard W. Foster. Johnsonia 2(20–21): 29–40, figs. 17–23, 1946. In addition to the excellent photographs and descriptions, fine drawings (by Ruth Turner) of the chondrophores and hinges of *Mya truncata* and *M. arenaria*, complete the monograph on the "long-necked" clams. One new species, *Haliotis barbouri* from Brazil, doubles the known haliotid fauna.—H. B. B.

Land and freshwater Mollusca. By G. Mandahl-Barth. Zoology of Iceland 4(65): 1–31, 3 maps of distribution, 1938. This survey of the inland mollusks of Iceland includes 3 tables, which compare the fauna of Iceland with those of Greenland and Europe, and concludes that all the Icelandic species, with perhaps the single exception of *Succinea groenlandica*, occur also in continental Europe.—H. B. B.

Thyonicola mortenseni n. gen., n. sp. Diacolax cucumariae n. gen., n. sp. By G. Mandahl-Barth. Vidensk. Medd. fra Dansk naturh. Foren., 104: 341–351, 11 figs., 1941, and 109: 55–68, 13 figs., 1946. Of these two parasitic snails, *Thyonicola* (Enteroxenidae) was found in a sea-cucumber, *Thyone serrata*, from southwest of the Cape of Good Hope. *Diacolax* (Eulimidae) came from the outside of another sea-cucumber, *Cucumaria mendax*, from the Falkland Islands.—H. B. B.

The genera Bathyaurinia, Rehderia and Scaphella in the western Atlantic. By William J. Clench. Johnsonia 2(22): 41–60, figs. 24–31, 1946. Of these three genera of Volutidae, *Rehderia*, type *Aurinia schmitti* Bartsch, is new. The use of *Scaphella* seems somewhat dubious; since Gray (1847) named two species as the types of *Scaphella* Swainson, did he make any valid type selection? New species are: *Rehderia georgiana*, *Scaphella* (*Aurinia*) *atlantis*, *S.* (*A.*) *cuba*, and *S.* (*A.*) *kieneri* for "*Fusus tessellatus*" Kiener. Beautiful half-tones of the old and of the new species of the genera are included.—H. B. B.

[Herrmannsen (1848) also named *Scaphella junonia* as type.]

THE NAUTILUS

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INDEXES TO NEW FAMILIES, GENERA, SPECIES, ETC., IN VOLUMES 35 TO 59

By H. BURRINGTON BAKER

Throughout these indexes, the number before a colon (:) gives the volume (followed when necessary by the part in parentheses), while any after a colon indicates a page. Thus, 37(2): 63 would mean that the name appears in volume 37, part 2, on page 63. An asterisk (*) before a name indicates that it is not new at the place cited. For example, the genus **Alcadia* is not new but the two subgenera *Hjalmarsona* and *Striatemoda* are proposed at 54: 70–71. Similarly, an asterisk before a page citation indicates that, in my judgment, the name does not date from the page cited. For example, *Acanthodoris columbina* is named and (partly) figured in 39(2): pls. 2 & 3 (plates 2 and 3), although its full description appears later in *(3): 94 (part 3, page 94).

Three indexes are presented: (1) index of innovations, (2) index by new trivial terms, and (3) index by innovating authors. The first and principal index lists alphabetically in full the new families, subfamilies, genera, subgenera (including sections), species and subspecies (including all trinomials) proposed in volumes 35 to 59 (both inclusive) of THE NAUTILUS. Under the genera, each species or subspecies (any trinomial) is arranged in the alphabetic order of its new and most trivial term. To shorten the index, more than one name may be included on one (or more) line, if these appear in the same paper and do not disturb the alphabetic order.

In the second index, the new trivial terms are arranged alphabetically without distinction between species and subspecies. Also, to make double columns practicable, the author's name, the subgenus, and usually all but one page citation are omitted.

In the third index, the innovating authors are arranged alphabetically. Under each are given the volumes and pages on which their new names appear.

One of the reasons for the publication of these indexes as a full number of THE NAUTILUS is the gradual lapse of two or three months in our dates of publication. These indexes give us a chance to get out once more on time.[1]

While I can only hope that this index be reasonably complete, quite a few names are included which are not labeled as new by their authors, on the chance that they might prove to be so. Also, names under the plates are regarded as new and valid, unless I happen to know that they were published before the date of the plate. In other words, a figure is considered a valid description of a new species or subspecies, and of a monotypic genus or subgenus.

Attention is called to the exact dates of THE NAUTILUS parts, subsequent to vol. 46, no. 2, which are printed in 48: 69, 49: 64, and in later volumes near p. 30 (28–33). In addition, "Scientific contributions made from 1882 to 1939 by Henry A. Pilsbry," published (1940) by the American Malacological Union, includes the exact dates of all other parts covered by these indexes.

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[1] This manuscript was sent to the printers January 20.

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AMERICAN MALACOLOGICAL UNION

The thirteenth annual meeting of the American Malacological Union will be held in Pacific Grove, California, Wednesday through Saturday, June 18 to 21, 1947. Andrew Sorensen and the Directors of Hopkins Marine Station are to be the hosts, and they have arranged for accommodations at Asilomar Hotel and Conference Grounds operated by the Young Women's Christian Association. Here the members can live and work together under the most delightful of conditions.

The attractive circular states that "twenty-eight capacious lodges sprawled beneath the pines present views of sea and dunes and the blue Pacific at every turn. . . . Scripps Hall and Guest Inn are lodges designed for as many as 115 guests with single or double rooms, hot running water, and living rooms cheerful with hearthfire comfort. (The rates for these rooms are $5.00 and $5.50 a day, per person, and accommodations for 20 are being

held for us.) Seven 'Longhouses' each with 15 double rooms, and Reserve Cottage with dormitory space for 50 are suitable for groups of men, women, or for both." (Rates for these are $3.50 per day per person, and accommodations for 50 have been reserved for us.) "Single beds are used throughout. All buildings have hot and cold showers and lavatories. Rates include room, linens and bedding, and truly marvelous meals." Meetings will be held in one of the Conference Halls on the grounds.

By motor, Asilomar is 120 miles south of San Francisco, 365 miles north of Los Angeles, 20 miles west of U. S. Highway 101 from Salinas, also reached by the beautiful Roosevelt Highway (California No. 1) directly on the coast. Southern Pacific R.R. or bus to Pacific Grove, taxi to Asilomar or United Airlines to Monterey Airport. Local bus service to points of interest on Monterey Peninsula.

A tentative program provides for registration Wednesday morning in the Conference Hall. Formal opening of the program Wednesday afternoon. Two prominent speakers will address us on two evenings. Dr. Rolf L. Bonin, Assistant Director of Hopkins Marine Station, a noted biologist and speaker will give an illustrated lecture on one of the evenings. There will be a visit to Hopkins Marine Station, the Pacific Grove Museum, and the bottom of Monterey Bay will be viewed through glass bottomed boats.

Bring walking shoes and a warm wrap. The mornings and evenings are cool and invigorating, and there will be collecting to do. There will be very low tides in the early mornings.

Please make reservations, as soon as possible, with Mr. Andrew Sorensen, 247 Granite St., Pacific Grove, California.

Error on plate 7.—Fig. 6 is *Pyrgulopsis nevadensis* (Stearns) and fig. 7 is *P. archimedis*, n. sp. (p. 76).

The editors apologize to S. Stillman Berry for their reversal of these figures.

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